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BIOLOGIA

Vol. 4 **DECEMBER 1958** **No. 2**

Key to the Indomalayan Termites

(Concluded)

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Subgenus *HYPOTERMES* Holmgren

KEY TO THE SPECIES
Imagoes

1. *Ocelli separated from the eyes by half their diameter;* head brown, densely hairy, broadly oval; the third antennal article shorter than the second; clypeus large, arched; pronotum with a T-shaped marking, anterior margin indistinctly indented in the middle; head length to tip of labrum 2.42, without mandibles 1.58, width 2.37; long diameter of eye 0.72, short diameter 0.58, distance from the lower margin of the head 0.73; ocellus length 0.31, width 0.26, distance from the eye 0.17; clypeus length 0.37, width 0.88; pronotum length 1.05, width 2.02. (Ahmad,1953) ... ... **Odontotermes (H) winifredae** Ahmad

   Ocelli separated from the eyes by distinctly more than half their diameter 2

2. *Larger species; head length to tip of labrum 2.47, width 2.23 (2.34-2 36); pronotum length 1.06(1.11-1.14), width 2.13(2.23-2.26);* head dark castaneous brown, thickly hairy; fontanelle dot-like; antennae with 19 articles, the third shorter than the second; postclypeus slightly shorter than half its width; pronotum with a T-shaped median marking, slightly indented anteriorly; head length without mandibles (1.56-1.71); long diameter of eye (0.62-0.63), short

diameter (0.54-0.59), distance from the lower margin of the head (0.10-0.13); ocellus length (0.32), width (0.23-0.26), distance from the eye (0.25). (Holmgren, 1913) ... ... **Odontotermes (H.) obscuriceps** (Wasmann)

Smaller species; head length to tip of labrum 2.15, width 1.89-1.90; pronotum length 0.87, width 1.71-1.79; head castaneous brown; ocelli separated from the eyes by more than their long diameter; the second antennal article as long as the third and fourth combined; pronotum trapeziform. (Holmgren, 1913) ... ... **Odontotermes (H.) xenotermitis** (Wasmann)

Soldiers

1. *Head length with mandibles 2.06-2.28, without mandibles 1.36-1.60;* head reddish brown, with a few scattered bristles, broadly oval behind, narrower in front, widest a little below the middle; antennae with 16-17 articles, the third slightly longer than the second; mandibles stoutly built; postmentum almost parallel-sided; pronotum saddle-shaped, antero-lateral sides broadly rounded, anterior margin convex, slightly indented in the middle, posterior margin rather distinctly emarginate; head width 1.14-1.27; length of the left mandible 0.70-0.79; postmentum length 0.79-0 88, widest width 0.39-0.48; narrowest width 0.30-0.39; pronotum length 0.48-0.57, width 0.90-1.01. (Ahmad, 1953) ... ... **Odontotermes (H.) winifredae** Ahmad

   Head length with mandibles up to 1.92, without mandibles up to 1.27 2

2. *Head somewhat parallel-sided, difference between widest width and width at the postero-lateral ends of the antennal foveolae 0.05-0.06;* antennae with 16 articles, the second one-and-a-half times as long as the third, the fourth shortest; pronotum slightly emarginate anteriorly; head length with mandibles (1.69)-1.75, without mandibles 1.14 (1.17)-1.22, width at the side base of the mandibles (0.59-0.67), at the postero-lateral ends of the antennal foveolae (0.85-0.91), widest width (0.91)0.95-(0.96)0.99; postmentum length (0.62-0.67), width (0.41-0.44); pronotum length (0.46-0.48), width (0.72)0.76-0.78(0.80). (Holmgren, 1914)... ... ... **Odontotermes (H.) sumatrensis** Holmgren

   Head not parallel-sided, sides convex, difference between the widest width and width at the postero-lateral ends of the antennal foveolae 0.09-0.13 3

3. *Pronotum indistinctly emarginate anteriorly; difference between widest head width and width at the postero-lateral ends of the antennal foveolae (0.09); head light brown;* antennae with 16 articles, the second twice as long as the third; labrum oval, extending up to half the length of the mandibles; pronotum somewhat emarginate posteriorly; head length with mandibles 1.63(1.82-1.92), without mandibles 1.14(1.24), width at the side base of the mandibles (0.65-0.70), at the postero-lateral ends of the antennal foveolae (0.92-0.96), widest width 0.95(1.01-1.05); postmentum length (0.70), width (0.39-0.41); pronotum length (0.41-0.48), width 0.73-(0.80). (Holmgren, 1913) ... ... **Odontotermes (H.) obscuriceps** (Wasmann)

Pronotum distinctly emarginate anteriorly; difference between widest head width and width at the postero-lateral ends of the antennal foveolae (0.13); head yellowish; antennae with 16 articles, the second almost twice as long as the third; labrum broadly rounded apically; pronotum indistinctly emarginate posteriorly; head length with mandibles 1.71-1.79(1.84), without mandibles 1.14-1.18(1.27), width at the side base of the mandibles (0.67-0.72), at the postero-lateral ends of the antennal foveolae (0.93-1.01), widest width 0.99-1.03(1.06-1.14); postmentum length (0.67-0.72), width (0.39); pronotum length (0.46-0.48), width 0.67(0.71)-0.72 (0.78). (Holmgren, 1913) ... ... **Odontotermes (H.) xenotermitis** (Wasmann)

Subgenus *EUSCAIOTERMES* Silvestri

Single Species : **Odontotermes (Euscaiotermes) primus** Silvestri

SOLDIER : Head ochraceous, slightly narrowed anteriorly, sparsely hairy, anterior part more hairy; antennae with 17 articles; mandibles stoutly built, tips slightly incurved; left mandible with a deep, broadly curved notch in the middle; head length without mandibles 2.85, width 2.40; mandible length 1.60. (Silvestri, 1923).

Genus *MICROTERMES* Wasmann

KEY TO THE SPECIES

Imagoes

1. Pronotum much lighter in colour than the head... 2
   Pronotum as dark as or only slightly lighter than the head... 6
2. *Anterior margin of pronotum strongly convex;* head light brown, densely hairy, elongately oval; eyes somewhat bulging; ocelli separated from the eyes by half their diameter; the second, third and fourth antennal articles subequal; postclypeus almost half as long as wide; pronotum large, distinctly incised in the middle

anteriorly; head length to tip of labrum 1.60, width 1.48; pronotum length 0.95, width 1.44; length of forewing 14.00. (Holmgren, 1913) ... ...**M. macronotus** Holmgren

Anterior margin of pronotum only slightly convex... 3

3. *Fontanelle large, very distinct;* head reddish brown, moderately hairy, round; eyes bulging; ocelli separated from the eyes by half their long diameter; antennae with 17-18 articles, the second as long as the third and fourth combined, the fourth shortest; pronotum slightly emarginate posteriorly; head length to tip of labrum 2.01(2.11-2.37), without mandibles (1.35-1.50), width (1.77)1.82-(1 85); long diameter of eye (0.43-0.52), short diameter (0.40-0.45), distance from the lower margin of the head (0.18-0.22); ocellus length (0.17-0.27), width (0.16-0.18), distance from the eye (0.09-0.13); pronotum length (0.90)0.95-(1.05), width (1.52)1.63-(1.73). (Holmgren, 1913) ... ... **M. mycophagus** (Desneux)

Fontanelle either not visible at all or only slightly distinct... 4

4. *Posterior lobes of mesonotum angularly rounded, distance between their tips 0.65-0.70;* antennae with 16-17 articles, in specimens with 16 articles the third shorter than the second; head width 1.48-1.60; pronotum length 0.74-0.86; pronotum width 1.34-1.38; length of forewing (with scale) 14.00-15.00. (Kemner, 1934)... ... ... **M. jacobsoni** Holmgren

Posterior lobes of mesonotum broadly rounded, distance between their tips less than 0.65... 5

5. *Pronotum as wide as or narrower than the head;* head brown, broadly pyriform; eyes large, bulging; ocelli prominent, separated from the eyes by less than half their diameter; antennae with 16-18 articles; postclypeus yellowish, half as long as wide; pronotum trapezoid, incised in the middle anteriorly, posterior margin straight or slightly depressed in the middle; head width 1.55-1.75; pronotum length 0.92-0.95, width 1.55-1.59; length of forewing 16.00-16.50. (Kemner, 1934)... ... ...**M. insperatus** Kemner

Pronotum wider than the head; head light castaneous brown, broadly oval; antennae with 17 articles, the second twice as long as the third; pronotum shallowly depressed anteriorly, incised in the middle, posterior margin straight; head length to tip of labrum 1.79, without mandibles (1.06-1.07), width 1.53(1.56-1.61); long diameter of eye (0.39-0.41), short diameter (0.35-0.39), distance from the lower margin of the head (0.16-0.23); ocellus length

(0.18-0.23), width (0.18-0.20), distance from the eye (0.06-0.08) postclypeus length (0.26-0.28), width (0.57-0.59); pronotum length 0.87-(0.88), width (1.36)1.44-(1.56). (Holmgren, 1913)... ... ...**M. pallidus** (Haviland)

6. *Ocelli very close to the eyes, separated by nearly one-third their short diameter;* pronotum and head uniformly castaneous brown; head round; eyes large, bulging, almost round; ocelli broadly oval; antennae with 15 articles, the second slightly longer than the third; postclypeus strongly arched, more than half as long as wide; pronotum indistinctly emarginate anteriorly, distinctly emarginate posteriorly; head length to tip of labrum 2.20, without mandibles (1.03-1.11), width (1.36-1.44)1.45; long diameter of eye 0.40, short diameter (0.35-0.37), distance from the lower margin of the head (0.09-0.11); ocellus length (0.18-0.25), width (0.12-0.18), distance from the eye (0.03-0.07); pronotum length (0.74-0.81) 0.90, width (1.22-1.25)1.35. (Snyder, 1933)... ... ...**M. unicolor** Snyder

Ocelli farther from the eyes... 7

7. *Eyes separated from the lower margin of the head by half their short diameter; fontanelle not visible; head thickly hairy,* dark brown, broadly rounded; antennae with 15 articles, the second one-and-a-half times as long as the third, postclypeus strongly arched, half as long as wide; pronotum nearly straight anteriorly, slightly emarginate posteriorly; head length to tip of labrum (1.66)1.79-(1.81)1.82, without mandibles (1.18-1.29), width 1.38(1.44)-1.48 (1.49); diameter of eye (0.29-0.34), distance from the lower margin of the head (0.15-0.18); ocellus length (0.13-0.18), width (0.09-0.13), distance from the eye (0.13-0.16); pronotum length (0.92) 0.95-0.99, width (1.40)1.44-(1.51). (Holmgren, 1913)... ....**M. sindensis** (Desneux)

Eyes separated from the lower margin of the head by one-third their short diameter; fontanelle visible, small; head sparsely hairy, reddish brown; antennae with 15 articles, the second a little longer than the third, the fourth and third subequal; postclypeus strongly arched; head length to tip of labrum 1.44(1.62-1.73), without mandibles (1.08-1.15), width 1.33-(1.42); long diameter of eye (0.36-0.40), short diameter (0.32-0.36), distance from the lower margin of the head (0.10-0.12); ocellus length (0.18-0.20), width (0.10-0.12), distance from the eye (0.08-0.10); pronotum length

(0.68)0.78-(0.83), width (1.22-1.30)1.33. (Holmgren, 1913)... ... ...**M. obesi** Holmgren

Soldiers

1. *Left mandible with a distinct and sharply pointed tooth near the tip;* head round; antennae with 15-16 articles, the second as long as the third and fourth combined; labrum triangularly pointed, twice as long as wide at base; pronotum slightly indented anteriorly; head length with mandibles 1.40- (1.48), without mandibles (0.85)-0.90, width (0.83); length of the left mandible (0.57), tooth from the tip (0.13); postmentum length (0.41), width (0.39); pronotum length 0.36, width (0.59). (Holmgren, 1913)... ... ...**M. globicola** (Wasmann)

   Left mandible either without or with a rudimentary tooth... 2

2. Head rectangularly oval to almost round; mandibles strongly hooked with a deep concavity in the outer margin at the base... 3

   Head elongately oval, distinctly narrowed anteriorly; mandibles slightly hooked, with a shallow concavity in the outer margin at the base... 6

3. Mandibles without a denticle... 4

   Mandibles with a denticle; head round, yellowish, sparsely hairy; antennae with 14 articles, the second slightly longer than the third; labrum tongue-shaped, with almost parallel sides; denticle of the mandibles placed a little in front of the middle, denticle of the left mandible placed slightly more posteriorly than that of the right mandible; pronotum distinctly emarginate anteriorly, almost straight posteriorly; head length with mandibles 1.14 (1.43)-1.52, without mandibles 0.80(0.83)-0.95, width at the side base of the mandibles (0.62-0.67), widest width 0.78(0.83)-(0.91) 0.95; postmentum length (0.41), width (0.39). (Kemner, 1934) ... ...**M. insperatus** Kemner

4. Mandibles very strongly hooked, tips incurved exactly latero-laterally... 5

   Mandibles not very strongly hooked, tips incurved rather antero-laterally; head yellowish, sparsely hairy, almost round; antennae with 15 articles, the second as long as the third and fourth combined; labrum slightly longer than wide, broadly rounded apically; pronotum slightly emarginate anteriorly; head length with mandibles 1.40-1.51, without mandibles 0.88-0.90, width 0.82-0.88;

postmentum length 0.53, width 0.43-0.49; pronotum length 0.37-0.40, width 0.55-0.61. (Ahmad, 1955).....**M. pakistanicus** Ahmad

5. *Larger species; head langth with mandibles (1.43-1.48)1.52, width (0.87)-0.99;* head brownish yellow, rectangularly oval; antennae with 15 articles, the second as long as the third and fourth combined, the third shortest; labrum broad tongue-shaped, broadly rounded apically; pronotum distinctly indented anteriorly; head length without mandibles 0.99; pronotum width 0.76. (Holmgren, 1913) ... ...**M. pallidus** (Haviland)

Smaller species; head length with mandibles 1.37, width 0.80, head length without mandibles 0.84; pronotum width 0.57. (Holmgren, 1913)... ... ...**M. jacobsoni** Holmgren

6. *Labrum tongue-shaped, very broadly rounded apically;* head light reddish brown, densely hairy, broadly oval; antennae with 15 articles, the second as long as the third and fourth combined; labrum extending up to three-fourths of the mandibles; pronotum distinctly notched anteriorly, indistinctly emarginate posteriorly; head length with mandibles (1.37-1.65)-1.67, without mandibles (0.82)1.03-(1.05), width (0.77)-0.95(0.97); postmentum length (0.42-0.52), width (0.37-0.46); pronotum length (0.37-0.46), width (0.56)0.65-(0.70). (Holmgren, 1913)... ... ...**M. mycophagus** (Desneux)

Labrum narrowly rounded apically... 7

7. *Labrum comparatively narrow at the tip, lancet-shaped;* head with fine erect hairs; antennae with 14 articles, the second as long as the third and fourth combined, the third and fourth subequal; labrum extending up to two-thirds of the mandibles; head length with mandibles 1.22, without mandibles 0.84, width 0.68; pronotum width 0.46. (Holmgren, 1913)... ... ...**M. incertoides** Holmgren

Labrum comparatively broad apically, somewhat tongue-shaped... ...8

8. *Head very densely hairy;* yellowish white; antennae with 14 articles, the second slightly shorter than the third and fourth combined, the third and fourth subequal; pronotum very deeply incised anteriorly, angle acute; head length with mandibles (1.40)-1.50 (1.54), without mandibles 0.88-0.95(1.00), width (0.72)-0.80(0.82); postmentum length (0.36-0.45), width (0.35-0.41); pronotum length 0.30-(0.34), width 0.50-(0.57). (Snyder, 1933a)... ... ...**M. unicolor** Snyder

Head moderately hairy; brownish yellow; antennae with 14 articles, the second as long as the third and fourth combined; pronotum distinctly notched anteriorly, slightly emarginate posteriorly; head length with mandibles (1.15)1.25-1.33(1.36), without mandibles (0.76)-0.84(0.85), width 0.72-0.76; postmentum length (0.37-0.42), width (0.35-0.38); pronotum length (0.28-0.35), width (0.46)0.49-(0.53). (Holmgren, 1913)... ... ...**M. obesi** Holmgren

Genus *HIRTITERMES* Holmgren *

Hirtitermes hirtiventris Holmgren

SOLDIER : head almost round without nasus (frontal projection), without hairs or bristles, nasus very long, dorsal profile slightly depressed; antennae with 13 articles, the third twice as long as the second; mandibles with two denticles at the base; head length with nasus 2.62, without nasus 1.71, width 1.22-1.29; pronotum width 0.61-0.65. (Holmgren, 1913)

Genus *LONGIPEDITERMES* Holmgren

Longipeditermes longipes (Haviland)

IMAGO: Head oval; ocelli very close to the eyes; pronotum straight anteriorly, antero-lateral corners broadly rounded. (Haviland in Holmgren, 1913).

MAJOR SOLDIER : Head dark brown, without hairs, broadly triangular, much wider than long (without nasus), nasus small, conical; antennae with 14 articles, the third more than three times as long as the second and two-and-a-half times as long as the fourth; pronotum neither indented anteriorly nor posteriorly; head length with nasus (2.08-2.10)2.38, without nasus 1.25, width (1.58-1.63)1.76; length of nasus (0.67-0.72); pronotum length (0.36-0.39), width (0.65-0.67) 0.72. (Holmgren, 1913).

MINOR SOLDIER : Head length with nasus (1.53-1.63) 1.75, without nasus (0.67)-0.87, width (0.75-0.80)0.87; pronotum length (0.23-0.26), width (0.41-0.46)0.49. (Holmgren, 1913).

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*The other two species of this genus, viz., *H. sinabangensis* Oshima and *H. spinocephalus* (Oshima), could not be included in this key because of the non-availability of the material and the description.

Genus *GRALLATOTERMES* Holmgren†

KEY TO THE SPECIES
Soldiers

1. *Head width (1.40)1.41-(1.45);* head almost black; frontal projection short, thick, conical; dorsal profile concave at the base of the nasus; antennae with 13 articles, the third nearly twice as long as the second and one-and-a-half times as long as the fourth; head length with nasus 1.95-(1.97-2.02), without nasus 1.33; length of nasus 0.62-(0.67); pronotum length (0.33-0.36), pronotum width (0.78-0.80). (Light & Wilson, 1936) ... ... **G. splendidus** Light & Wilson

   Head width 1.17-1.22 2

2. *Abdominal tergites as dark as the head, dark brown;* nasus short, thick, conical, uplifted; dorsal profile slightly sinuous, depressed; antennae much longer than the head with nasus; antennae with 13 articles, the third twice as long as the second and as long as the fourth; head length with nasus (1.79)-1.80, width 1.20-(1.22); pronotum length (0.39-0.41)0.42, width (0.67-0.69)0.72. (Light & Wilson, 1936) ... ...? ... ...**G. admirabilus** Light

   Abdominal tergites much lighter than the head, pale brown; head without nasus triangularly rounded; nasus short, thick, conical; dorsal profile deeply concave; antennae with 13 articles, the third twice as long as the second; pronotum not indented anteriorly; head length with nasus 1.90, without nasus 1.10, width 1.18; pronotum length 0.36, width 0.65. (Holmgren, K. & N., 1917) ... ... **G. grallatoriformis** (Holmgren, K. & N.)

Genus *BULBITERMES* Emerson*

KEY TO THE SPECIES
Imagoes

1. Ocelli very close to the eyes, separated by less than half their diameter 2

   Ocelli farther from the eyes, separated by nearly half their diameter...4

---

†Imago of only one species, viz., *G. admirabilus* Light is known. Its description by Light & Wilson (1936) is as follows: Head black; fontanelle white, conspicuous, three-rayed; ocelli conspicuous; eye very large, strongly bulging; head length to tip of labrum 1.80, without mandibles 1.20-1.25, width 1.90; diameter of eye 0.72; ocellus length 0.22; fontanelle length 0.16; pronotum length 0.97-1.00, width 1.80.

**Bulbitermes brevicornis* Light & Wilson, *B. busuangae* Light & Wilson and *B. mcgregori* Light & Wilson, all represented by the soldier caste alone, were formerly included in the genus *Nasutitermes*.

2. Third antennal article as long as the second 3

Third antennal article shorter than the second; head dark castaneous brown; fontanelle large; hind margin of pronotum bow-shaped; forewing without subcostal stripe; head length to tip of labrum 1.52, width 1.33; pronotum length 0.68, width 1.10; length of forewing 10.00. (Holmgren, 1913) ... ... **B. singaporiensis** (Hav.)

3. *Length of forewings 10.00; head width 1.55;* head dark castaneous brown; fontanelle oval, raised; pronotum slightly emarginate posteriorly; head length to tip of labrum 1.56; pronotum length 0.65, width 1.06. (Holmgren, 1913)... ... **B. germanus** (Haviland)

Length of forewings 12.00; head width 1.33(1.37)-(1.40)1.41; head dark castaneous brown, with a few scattered bristles; fontanelle oval, smaller than the ocellus; antennae with 15 articles, the third as long as the second; postclypeus short, somewhat swollen; pronotum much lighter in colour than the head, indistinctly emarginate posteriorly; head length to tip of labrum (1.69)-1.71; without mandibles (1.04-1.11); long diameter of fontanelle (0.14), short diameter (0.07); long diameter of. eye (0.50), short diameter (0.42-0.46), distance from the lower margin of the head (0.10-0.13); ocellus length (0.20-0.23), width (0.13-0.15), distance from the eye (0.037-0.039); pronotum length 0.68-(0.70), width 1.06(1.07)-(1.11)1.14. (Holmgren, 1913)... ... ...**B. sarawakensis** (Haviland)

4. Fontanelle distinct, large 5
Fontanelle indistinct 9

5. *Pronotum distinctly emarginate posteriorly*: head brown, with a few scattered bristles; fontanelle large, oval; ocelli separated from the eyes by their short diameter; third antennal article longer than the second, the latter slightly longer than the fourth; pronotum almost straight anteriorly, sides strongly converging behind; head length to tip of labrum 1.45-1.52, width 1.31-1.32; pronotum length 0.53-0.65; pronotum width 1.16. (Kemner, 1934)... ... ... **B. salakensis** (Kemner)

Pronotum indistinctly emarginate posteriorly 6

6. *Head width (1.50)-1.52*; head dark brown, with a few scattered bristles; fontanelle large, ocellus-like, larger than the ocellus; antennae with 15 articles, the third longer than the second; pronotum halfmoon-shaped; head length to tip of labrum (1.74), without mandibles (1.22); long diameter of eye (0.41), short diameter (0.39), distance

from the lower margin of the head (0.09); ocellus length (0.15), width (0.12), distance from the eye (0.10); pronotum length 0.76-(0.83), width (1.32)-1.37. (Holmgren, 1914)... ... ... **B. constrictiformis** (Holmgren)

Head width less than 1.50 7

7. *Third antennal article one-and-a-half times as long as the second;* head reddis brown, oval; fontanelle prominent, ocellus-like, with three dots in front; antennae with 15 articles; pronotum slightly lighter in colour than the head; abdominal tergites very dark brown; head length with labrum (1.43)-1.51, without mandibles (0.91), width 1.42-(1.43); long diameter of eye 0.41-(0.45), width (0.39)-0.41, distance from the lower margin of the head (0.07); ocellus length (0.14)-0.16, width (0.11), distance from the eye (0.10)-0.12; pronotum length (0.65)-0.77, width (1.17)-1.22. (Light, 1937) ... ... **B. neopusillus** Snyder & Emerson

Third antennal article as long as the second 8

8. *Difference between head width and pronotum width 0.08; head dark brown,* sparsely hairy; fontanelle large, oval; antennae with 14 articles; pronotum straight anteriorly, slightly emarginate posteriorly; body length with wings 14.00; head length to tip of labrum 1.38-1.41, width 1.31; pronotum length 0.77, width 1.23. (Kemner, 1934) ... ... **B. vicinus** (Kemner)

Difference between head width and pronotum width 0.23; head light brown, sparsely hairy; second, third and fourth antennal articles subequal; pronotum trapezoid, straight anteriorly, slightly emarginate posteriorly; head width 1.33, pronotum length 0.68,width 1.10. (Holmgren, 1913) ... ... **B. kraepelini** (Holmgren)

9. *Pronotum width 1.20, anterior margin slightly concave;* head latricious; antennae with 15 articles; body length without wings 5.00. (Haviland in Holmgren, 1913) ... ... **B. constrictus** (Haviland)

Pronotum width 1.00, anterior margin straight; head castaneous; antennae with 15 articles, the second and third subequal; pronotum slightly emarginate posteriorly; length of forewings 9.00. (Haviland in Holmgren, 1913) ... ... **B. borneensis** (Haviland)

Soldiers

1. Small species; head length with nasus 1.14-1.18 2
Large species; head length with nasus 1.27-1.94 3

B. kraepelini Hirsch.

depressed; nasus rather conical; nasus 1.24, without nasus 0.68, width

... ... B. borneensis

tooth at the tip... ... ...

4. Large species; head length with nasus 1.80–1.74, without nasus 1.20–1.25 (1.27); apical portions of both the mandibles with a tooth; nasus cylindrical, without basal hump; antennae with

B. gravensis

5. Apical portion of the mandible with a minute

6. *Apical portion of the mandible in level with the anterior margin of the molar area;* head orange brown; nasus cylindrical; dorsal profile concave; antennae with 13 articles, the third twice as long as the second and one-and-a-half times as long as the fourth, the fourth and fifth subequal; head length with nasus (1.48)-1.52, width (0.83)-0.87, length of nasus (0.44)-0.48; pronotum length (0.18), width (0.46). (Light & Wilson, 1936)... ... ...**B. busuangae** (Light & Wilson)

Apical portion of the mandible much higher than the level of the molar area... 7

7. Nasus comparatively long, difference between the head length and nasus length 0.27-0.38 8

Nasus comparatively short, difference between head length and nasus length more than 0.38... 11

8. *Smaller species; head length with nasus 1.27 (1.35)-1.44;* head brown, tip of the nasus lighter; dorsal profile concave; hump at the base of the nasus slightly indicated; nasus somewhat conical; antennae with 12-13 articles, in specimens with 12 articles the third nearly twice as long as the second and slightly longer than the fourth; head width 0.72(0.78)-0.81; pronotum length (0.18), width 0.78. (Holmgren, 1913)... ... ...**B. singaporiensis** (Haviland)

Larger species; head length with nasus more than 1.44... 9

9. *Antennae with 12 articles;* head pale brown, pear-shaped; dorsal profile nearly concave, third antennal article as long as the second; head length with nasus 1.56, without nasus 0.90, width 0.63; pronotum width 0.46. (Light & Wilson, 1936)... ... ...**B. mcgregori** (Light & Wilson)

Antennae with 13-14 articles... 10

10. *Pronotum width 0.42(0.46)-0.48;* head light yellow brown, with a prominent convexity in the posterior margin; nasus cylindrical, without basal hump; dorsal profile concave; antennae with 14 articles, the third almost as long as the second; head length with nasus 1.52(1.61)-1.66, width 0.81 (0.91)-0.92; pronotum length (0.20)-0.24. (Kemner, 1934)... ... ...**B. rosae** (Kemner)

Pronotum width 0.61; nasus rather conical, thick at the base; antennae with 13-14 articles; head length with nasus 1.52-1.63, without

nasus 0.95, width 0.91-0.95. (Holmgren, 1913)... ... ...**B. nasutus** (Holmgren)

11. *Antennae with 12 articles;* head orange coloured, sparsely hairy; nasus cylindrical, with a slight hump at the base; dorsal profile concave; third antennal article one-and-a-half times as long as the second and slightly longer than the fourth; abdominal tergites brownish, each with a row of bristles at the posterior margin; head length with nasus (1.35)-1.37, length of nasus (0.42), width 0.76-(0.83); pronotum length (0.20), width 0.42 (Holmgren, 1913) ... ...**B. flavicans** (Holmgren)

Antennae with 13-14 articles... 12

12. *Pronotum width (0.61)0.65;* head orange coloured; nasus somewhat conical, without basal hump; dorsal profile straight; mandibles with long awl-shaped apical portions; antennae with 14 articles, the third slightly longer than the second and as long as the fourth; head length with nasus 1.82, without nasus 1.14, width (1.11)-1.12 pronotum length (0.28). (Holmgren, 1914)... ... ...**B. subulatus** (Holmgren)

Pronotum width up to 0.55... 13

13. *Nasus distinctly more than half the length of the head capsule;* head light orange coloured; nasus distinctly cylindrical; dorsal profile depressed; antennae with 13 articles, the third slightly less than twice as long as the second and one-and-a-half times as long as the fourth; head length with nasus 1.60-1.63(1.66-1.69), width 0.80-0.87 (0.91); length of nasus (0.65); pronotum length (0.20-0.23), width 0.49 (0.52-0.55). (Holmgren, 1913)... ... ...**B. constrictoides** (Holmgren)

Nasus shorter... 14

14. Head length with nasus 1.34-1.50... 15
Head length with nasus more than 1.50... 18

15. *Nasus shorter than half the length of the head capsule;* head orange-brown, pear-shaped, elevated, and greatly produced behind; dorsal profile concave but sinuous; mandibles with long apical portions; head length with nasus 1.44, without nasus 0.98, width 0.90, length of nasus 0.46. (Light & Wilson, 1936)... ... ...**B. brevicornis** (Light & Wilson)

Nasus as long as or slightly longer than half the length of the head capsule... 16

16. *Head orange coloured;* nasus cylindrical, with a slight basal hump; dorsal profile concave; antennae with 13 articles, the third one-and-a-half times as long as the second; head length with nasus (1.35-1.40) 1.44, width (0.75-0.80) 0.83; length of nasus (0.46-0.49); pronotum length (0.17), width (0.44)-0.49. (Holmgren, 1914)... ... ...**B. neopusillus** Snyder & Emerson

Head darker in colour... 17

17. *Hind femora rust yellow; head reddish brown;* nasus rather conical; dorsal profile slightly depressed; antennae with 13 articles, the third twice as long as the second, the third and fourth subequal, pronotum slightly incised anteriorly; abdominal tergites slightly lighter in colour than the head; head length with nasus 1.43-1.50, width 0.93; length of nasus 0.40; pronotum length 0.20-0.23, width 0.44-0.49. (All measurements by the author)... ... ...**B. sarawakensis** (Haviland)

Hind femora brown; head dark brown; nasus conical, with a slight basal hump; dorsal profile concave; antennae with 13 articles, the third nearly one-and-a-half times as long as the second and twice as long as the fourth; head length with nasus (1.43)-1.48, width (0.80)-0.89; length of nasus (0.50); pronotum length (0.20), width (0.42). (Holmgren, 1913)... ... ...**B. germanus** (Haviland)

18. Head yellow... 19

Head smoky brown, greatly produced behind; nasus with a low basal hump; antennae with 13 articles, the third twice as long as the second; head length with nasus 1.56-1.68, without nasus 1.05-1.20, width 0.87-1.02. (Light & Wilson, 1936)... ... ...**B. constricticeps** (Light & Wilson)

19. *Larger species; head length with nasus 1.66(1.79 1.82), width (0.96) 1.03-1.10;* head without bristles; nasus cylindrical, rather thick at the base, without basal hump; profile concave; antennae with 13 articles, the third as long as the second and one-and-a-half times as long as the fourth; pronotum length (0.23), width (0.52)-0.53 (Holmgren, 1914)... ... ...**B. constrictiformis** (Holmgren)

Smaller species; head length with nasus 1.52(1.53-1.56), width 0.83 (0.84-0.93); nasus cylindrical, without basal hump; dorsal profile concave; antennae with 13-14 articles, the third as long as or twice as long as the second; length of nasus (0.49-0.54); pronotum

length (0.20), width (0.46)-0.49. (Holmgren, 1913)... ... ...**B. constrictus** (Haviland)

Genus *LACESSITITERMES* Holmgren

KEY TO THE SPECIES

Imagoes

1. Ocelli separated from the eyes by a distance appreciably more than their short diameter... 2

   Ocelli separated from the eyes by a distance less than their short diameter 8

2. *Ocelli separated from the eyes by more than their long diameter;* head dark brown; fontanelle narrow, slit-like, surrounding area slightly sunken; pronotum not notched posteriorly; head length with labrum 2.16, without mandibles 1.50, width 1.83; diameter of eye 0.45, distance between the inner margins of the eyes 1.43; ocellus length 0.20; length of fontanelle 0.11; pronotum length 0.81, width 0.50. (Light & Wilson, 1936)... . ...**L. palawanensis** Light

   Ocelli separated from the eyes by a distance equal to or slightly less than their long diameter... 3

3. *Posterior margin of pronotum deeply notched;* head black brown; fontanelle lancet-shaped, slightly longer than the ocellus, flaring anteriorly to form lateral points which continue up to ocelli as faint lines; antennae light yellow brown; pronotum with a brown mark; wing membrane light brown; head length to tip of labrum 2.16, width 1.87; diameter of eye 0.55; long diameter of ocellus 0.20, short diameter 0.16; pronotum length 0.84, width 1.54. (Light & Wilson, 1936)... ... ...**L. holmgreni** Light & Wilson

   Posterior margin of pronotum entire or only slightly notched... ...4

4. *Head width 1.80-2.01*; head dark brown, scantily hairy; antero-lateral corners of fontanelle flaring into points which continue as faint lines terminating before reaching the ocelli; antennae with 15 articles, the third longer than the second; pronotum thickly hairy; eye length 0.53-0.56; pronotum length 0.92-0.95, width 1.51-1.73; length of forewings 16.50-19.00. (Kemner, 1930) ... ...**L. jacobsoni** Kemner

   Head width not exceeding 1.76... 5

5. *Pronotum small, length 0.57, width 1.22; eyes large, distance between their inner margins 1.02;* head dark brown, with a few scattered bristles; fontanelle slit-like; antennae with 15 articles, the third considerably longer than the second; pronotum thickly hairy, slightly incised anteriorly, weakly emarginate posteriorly; head length to tip of labrum 1.82, width 1.60; length of forewings 11.00-11.50. (Holmgren, 1913)... ... .**L. lacessitiformis** (Holmgren)

Pronotum large, length 0.72-0.83, width 1.29-1.41; distance between the inner margins of the eyes more than 1.03... 6

6. Ocelli separated from the eyes by a distance slightly less than their long diameter... 7

Ocelli separated from the eyes by almost their short diameter; head dark brown, with a few scattered bristles; fontanelle very small, slit-like; antennae with 15 articles, the third as long as the second; pronotum thickly hairy, brown; head length to tip of labrum 1.63, width 1.67; pronotum length 0.76, width 1.29. (Holmgren, 1913)... ... ...**L. atrior** (Holmgren)

7. *Pronotum not emarginate posteriorly;* head broadly oval, dark brown, fontanelle large, as long as the ocellus, shaped like ocellus; eyes round; antennae with 15 articles, the third indistinctly longer than the second and as long as the fourth; head length to tip of labrum 1.90-(2.08), without mandibles (1.26), width 1.67-(1.76); diameter of eye (0.49), distance from the lower margin of the head (0.15); ocellus length (0.18), width (0.11), distance from the eye (0.15); pronotum length 0.76-(0.83), width 1.29-(1.34); length of forewings 12.00. (Holmgren, 1913)... ... ...**L. filicornis** (Haviland)*

Pronotum somewhat emarginate posteriorly; head dark brown, with a few scattered bristles; fontanelle oval; antennae with 15 articles, the third slightly longer than the second; pronotum brown; wings thickly hairy, head length to tip of labrum 1.83, width 1.75; pronotum length 0.72, width 1.41; length of forewings 13.00-14.00. (Holmgren, 1913)... ... ...**L. albipes** (Haviland)

Soldiers

1. All abdominal tergites with a row of bristles at their hind margin... 2

*According to Holmgren (1913) the ocelli in *E. filicornis* are separated from the eyes by double their long diameter, whereas the specimen in the author's collection from Sarawak Museum has ocelli distinctly larger.

Only the hind abdominal tergites with a row of bristles at their hind margin... 8

2. *Soldiers dimorphic;* MAJOR SOLDIER: head deep black or black brown, seen from above pear-shaped; nasus cylindrical, tip lighter in colour than the head; dorsal profile depressed; antennae rust yellow to brown, with 14 articles, the third twice as long as the second, slightly shorter than the fourth; legs rust yellow; head length with nasus 1.84-1.92(2.02), without nasus 1.16-1.20, width 1.09-1.16(1.19); pronotum length (0.36), width 0.63-(0.67). (Kemner, 1934). MINOR SOLDIER: head deep black to black brown; dorsal profile depressed; antennae light brown, with 14 articles, the third only slightly longer than the second; head length with nasus (1.61) 1.66-(1.76)1.77, without nasus 0.99-1.09; width 0.86(0.88)-(0.96) 0.99; length of nasus (0.67-0.69); pronotum length (0.26-0.28), width 0.46-0.49(0.54). (Kemner, 1934)... ....**L. batavus** Kemner

Soldiers monomorphic... 3

3. *Large species; head length with nasus 1.80, without nasus 1.06, width 1.14;* head almost black, with one or two hairs posteriorly; nasus elevated, with a slight basal hump; dorsal profile depressed; antennae lighter in colour than the head, tip reddish, twice as long as the head, with 14 articles, the second and third subequal; length of nasus 0.72, thickness in the middle 0.20. (Light & Wilson, 1936)... ....**L. holmgreni** Light & Wilson

Small species; head length with nasus up to 1.67, without nasus up to 0.87, width up to 1.03... 4

4. *Head length without nasus (1.06)-1.07;* head black brown, with one or two hairs posteriorly; nasus cylindrical, with a slight basal hump; dorsal profile depressed; antennae with the first article dark smoky brown, proximal articles rusty brown, distal light yellow brown, the third article twice as long as the second, the third and fourth subequal; head length with nasus 1.62-(1.63), width (0.91)-1.02; pronotum length 0.26, width 0.58. (Light & Wilson, 1936)... ... ...**L. palawanensis** Light

Head length without nasus up to 0.87... 5

5. Antennae, coxae, tibiae and abdominal tergites black brown to black... 6

Antennae, coxae, tibiae and abdominal tergites rusty yellow to brown 7

6. *Head width 1.03;* head black, with scattered hairs; tip of nasus darker than its basal part, the third antennal article longer than the second; head length with nasus 1.67, without nasus 0.83; pronotum width 0.57. (Holmgren, 1913)... ... ...**L. piliferus** (Holmgren)

Head width (0.83)-0.91; head black, with one or two bristles; tip of nasus darker than its basal part; antennae black brown, with 14 articles, the third one-and-a-half times as long as the second, and indistinctly shorter than the fourth; pronotum dark brown; abdominal tergites with a row of short bristles; head length with nasus (1.56)-1.60, without nasus 0.76; pronotum length (0.26), width (0.46)-0.53. (Holmgren, 1913)... ... ...**L. sordidus** (Haviland)

7. *Tip of the nasus of the same colour as the head;* head light reddish brown; dorsal profile concave; antennae lighter in colour than the head, with 14 articles, the third slightly longer than the second and distinctly shorter than the fourth; head length with nasus 1.53-(1.66), without nasus (0.80), width 0.95-(1.04); pronotum length (0.26), width 0.53-(0.54). (Holmgren, 1913).... ... .**L. laborator** (Haviland)

Tip of the nasus lighter in colour than the head; antennae with 14 articles, the third slightly longer than the second and distinctly shorter than the fourth; head length with nasus (1.58-1.60)1.63, without nasus 0.87, width (0.93)-0.95; pronotum length (0.26), width (0.49)-0.53. (Holmgren, 1913)... ... ...**L. filicornis** (Haviland)

8. *Antennae, coxae and tibiae whitish;* head dark brown, without hairs; nasus reddish at tip, conical; dorsal profile strongly depressed; antennae with 14 articles, the third twice as long as the second and slightly shorter than the fourth; head length with nasus 1.82, without nasus 0.91, width 1.14, pronotum width 0.53. (Holmgren, 1913)... ... ...**L. albipes** (Haviland)

Antennae, coxae and tibiae darker... 9

9. *Nasus distinctly shorter than the head capsule, difference between head length and nasus length 0.45-0.53;* head almost black; nasus uniformly coloured; antennae brown, third antennal article one-and-a-half times as long as the second; legs brown; head length

with nasus 1.73-2.01, without nasus 1.09-1.27, width 0.99-1 20; pronotum width 0.63-0.68. (Kemner, 1930)... ... .**L. jacobsoni** Kemner

Nasus as long as or only slightly shorter or longer than the head capsule; if shorter, the difference between the head length and nasus length 0.11... 10

10. Antennae, tibiae and tarsi rust coloured... 11

Antennae, tibiae and tarsi brown to black... 12

11. *Nasus slightly longer than the head capsule;* head dark brown to black; nasus rather conical; antennae with 14 articles, the third slightly longer than the second; head length with nasus (1.56-1.61) 1.67, without nasus 0.80, width (0.82-0.85)0.95; pronotum length (0.26), width (0.44-0.46). (Holmgren, 1913)... ....**L. lacessitus** (Haviland)

Nasus slightly shorter than the head capsule; head brown; nasus lighter in colour than the head, conical; antennae with 14 articles, the third somewhat longer than the second; head length with nasus 1.63, without nasus 0.87, width 0.99; pronotum width 0.57. (Holmgren, 1913)... ... .**L. ransoneti** (Holmgren)

12. *Third antennal article nearly twice as long as the second;* head almost black, without hairs; nasus without basal hump; dorsal profile concave; antennae with 14 articles; pronotum not emarginate anteriorly, slightly indented posteriorly; abdominal tergites dark brown; head length with nasus (1.79)1.86-1.92, without nasus 0.87, width (1.06)1.14-1.17; pronotum length (0.31-0.33), width 0.57-(0.62). (Holmgren, 1913)... ... ...**L. atrior** (Holmgren)

Third antennal articles as long as or slightly shorter than the second... 13

13. *Third antennal article as long as the second;* head black, without hairs; tip of nasus reddish; dorsal profile concave; antennae with 14 articles, the fourth distinctly longer than the third; pronotum not indented anteriorly; head length with nasus 1.60, without nasus 0.80, width 0.90, pronotum width 0.49. (Holmgren, 1913)... ....**L. lacessitiformis** (Holmgren)

Third antennal article slightly shorter than the second; head length with nasus 1.63, without nasus 0.80, width 0.87; pronotum width 0.49. (Holmgren, 1913)... ... **L. breviarticulatus** (Holmgren)

Genus *HOSPITALITERMES* Holmgren

KEY TO THE SPECIES

Imagoes

1. Fontanelle as large as the ocellus... 2
   Fontanelle larger than the ocellus... 4

2. *Antennae pale, third article one-and-a-half times as long as the second,* postclypeus short, swollen; antennae with 15 articles, pronotum not emarginate posteriorly; tibiae light yellow; head length to tip of labrum 1.79, width 1.63; pronotum length 0.99, width 1.44. (Holmgren, 1913)... .... **H. monoceros** (Holmgren)

   Antennae darker, third article twice as long as the second, if shorter the antennae with 16 articles... 3

3. *Antennae brownish yellow;* head brownish black; fontanelle narrower than the ocellus; ocelli separated from the eyes by their short diameter; antennae with 15-16 articles, in specimens with 15 articles the third twice as long as the second and in specimens with 16 articles the third shorter; posterior margin of pronotum depressed; meso- and metanota deeply notched posteriorly; head length to tip of labrum 1.74, width 1.68; diameter of eye 0.45, ocellus length 0.19, width 0.12; pronotum length 0.90, width 1.45. (Light & Wilson, 1936)... ... ...**H. luzonensis** Oshima

   Antennae brown; head black brown; slightly lighter anteriorly; fontanelle oval; antennae with 15 articles; ocelli separated from the eyes by their short diameter; postclypeus short, slightly swollen; head length to tip of labrum 1.90, width 1.63; pronotum length 0.99, width 1.52. (Holmgren, 1913)... ... ...**H. hospitalis** (Haviland)

4. *Pronotum only slightly narrower than the head; third antennal article twice as long as the second;* head dark brownish red, with a few scattered bristles; fontanelle large, oval, with three spots in front; ocelli separated from the eyes by more than their short diameter; antennae light brown, with 15 articles; postclypeus two-and-a-half times as wide as long; pronotum slightly emarginate behind; head length to tip of labrum 1.87-1.98, width 1.59-1.66; pronotum length 1.06, width 1.55. (Kemner, 1934)... ... ...**H. diurnus** Kemner

   Pronotum distinctly narrower than the head; third antennal article not twice as long as the second; head black brown, without hairs;

fontanelle yellowish-white; ocelli separated from the eyes by their diameter; pronotum indistinctly emarginate posteriorly; head length to tip of labrum 1.82, width 1.71; pronotum length 1.10, width 1.48. (Holmgren, 1913)... ... ...**H. umbrinus** (Holmgren)

Soldiers

1. *Abdominal tergites black in sharp contrast with the rest of the body;* head yellowish brown; nasus with upper margin convex; dorsal profile strogly depressed; antennae with 14 articles, the third slightly more than twice as long as the second; head length with nasus 1.66-1.73, without nasus 1.13-1.26, width 0.99-1.09; pronotum width 0.56-0.63. (Kemner, 1934) ... ... **H. diurnus** Kemner

   Abdominal tergites much lighter in colour, not standing in sharp contrast with the rest of the body... 2

2. *Head light yellow,* without hairs; dorsal profile concave, nasus slightly darker than the head; legs yellow; abdominal tergites somewhat brownish; head length with nasus 1.86, without nasus 0.99, width 1.03; pronotum width 0.61. (Holmgren, 1913)... ... ...**H. lividiceps** (Holmgren)

   Head darker... 3

3. Third antennal article nearly twice as long as the second... 4
   Third antennal article three times as long as the second... 11

4. *Antennae uniformly yellow to brownish yellow; legs yellow;* head dark brown, with a reddish tinge; nasus somewhat conical, lighter in colour than the head; antennae with 14 articles, the third slightly more than twice as long as the second; legs yellow; abdominal tergites brownish; head length with nasus 1.79, without nasus 1.06, width (1.11-1.14)1.18; pronotum length (0.36), width (0.62-0.65)0.68. (Holmgren 1913)... ... ...**H. bicolor** (Haviland)

   Antennae darker in colour either uniformly or in basal half; legs darker... 5

5. *Head length with nasus 1.44,* head reddish brown; antenna of the same colour as the head, basal articles darker, third article slightly less than twice as long as the second; tibiae and tarsi straw coloured; head length without nasus 0. 76, width 0.95. (Holmgren, 1913)... ... ...**H. rufus** (Haviland)

   Head length with nasus 1.63-2.80... 6

6. *Head width 1.27-1.30;* head dark castaneous brown, without hairs; nasus conical; abdominal tergites with a row of bristles at the posterior margin; head length with nasus 1.76(1.80-1.95), without nasus 1.15; pronotum length (0.39)-0.45; width (0.67)-0.80. (Snyder, 1934)... ... ...**H. madrasi** (Snyder)

Head width not exceeding 1.19... 7

7. *Head capsule distinctly wider than long, difference between head width and head length 0.16; hind part of abdomen yellow above;* head brown, without hairs; nasus somewhat conical, lighter in colour than the head; third antennal article twice as long as the second; head length with nasus 1.63, without nasus 0.87, width 1.03, pronotum width 0.61. (Holmgren, 1913)... ... ...**H. flaviventris** (Holmgren)

Head capsule as wide as long or slightly wider or slightly narrower; hind part of abdomen brown... 8

8. *Head length with nasus 2.00-2.08;* head light brownish red to black, with a few scattered hairs; antennae brownish, basal article slightly darker, third article as long as the fourth; head length without nasus 1.14, width 1.14-(1.19); pronotum length (0 33-0.36); width 0.65-(0.67). (Holmgren, 1914)... ... ...**H. butteli** (Holmgren)

Head length with nasus up to 1.82... 9

9. *Head capsule slightly wider than long; nasus more than half the length of the head capsule;* head dark brown, tip of nasus light reddish brown; antennae uniformly brown, third article about twice as long as the second and slightly longer than the fourth; head length with nasus (1.74)1.79-(1.82), without nasus 1.06, width (1.09-1.13)1.14; pronotum length (0.36-0.39), width (0.59-0.62) 0.65. (Holmgren, 1913)... ... ...**H. monoceros** (Holmgren)

Head capsule longer than wide; nasus slightly less than half the length of the head capsule... 10

10. *Head reddish brown; nasus with an inconspicuous basal hump; antennae, coxae and femora brown;* head with two bristles at the vertex, another two just behind the nasus and one on the nasus; antennae with 14 articles, the third twice as long as the second and slightly longer than the fourth; head length with nasus 1.62-1.82, length of nasus (from the tip to the innermost point below the base measured along the axis of the nasus)

0.50-0.58, head width 1.09-1.19; pronotum length 0.31-0.36, width 0.63-0.67. (Ahmad, 1947)... ... ...**H. schmidti** Ahmad

Head black to dark mahogony brown; nasus with a distinct basal hump (inconspicuous in some specimens); tibiae and tarsi pale; nasus slightly lighter in colour than the head; first two antennal articles as dark as the head, rest brown; femora dark brown; head length with nasus (1.61)-1.74(1.76), without nasus 1.20, width (0.98-1.09)1.11; pronotum length (0.33-0.36), width (0.57-0.62). (Light & Wilson, 1936)... ... ...**H. luzonensis** (Oshima)

11. *Antennae darker in the basal half;* head reddish brown to black; nasus slightly lighter in colour than the head, conical; dorsal profile depressed; antennae with 14 articles; pronotum not indented anteriorly; head length with nasus 1.58-1.69(1.86), without nasus 1.06, width (0.98-1.09)1.18; pronotum length (0.33-0.39), width (0.52-0.57)0.68. (Holmgren, 1913)... ... ...**H. umbrinus** (Haviland)

Antennae uniformly coloured... 12

12. *Posterior part of abdomen yellow to brownish yellow;* head dark brown; without basal hump; dorsal profile strongly depressed; antennae uniformly brown; the third antennal article only slightly longer than the fourth; head length with nasus (1.74-1.82)1.98, without nasus 1.10, width (1.09)1.18-(1.22); pronotum length (0.36-0.39), width (0.59-0.62) 0.72. (Holmgren, 1913)... ... ...**H. medioflavus** (Holmgren)

Posterior part of abdomen uniformly brown... 13

13. *Third antennal article as long as the fourth;* head antennae and abdominal tergites castaneous brown; pronotum yellowish brown, shallowly emarginate posteriorly; head length with nasus 1.75-1.80, without nasus 1.15-1.20, width 1.20, pronotum length 0.50, width 0.75. (Snyder, 1934)... ... ...**H. jepsoni** Snyder

Third antennal article longer than the fourth... 14

14. *Nasus half as long as the head capsule;* head light castaneous brown, without hairs; antennae, femora and abdomen brown; head length with nasus 1.85-1.95, without nasus 1.30-1.35, width 1.30-1.40; pronotum length 0.40, width 0.70. (Snyder, 1934)... ... ...**H. birmanicus** (Snyder)

Nasus more than half the length of the head capsule; head dark reddish brown to black; nasus without basal hump; dorsal profile

concave; fourth antennal article two-and-a-half times as long as the second; head length with nasus (1.76)-1.79, without nasus 1.06, width (1.09-1.14)1.18; pronotum length (0.39), width (0.61-0.62)0.65. (Holmgren, 1913)... ....**H. hospitalis** (Haviland)

Genus *HAVILANDITERMES* Light

Single species : **H. atripennis** (Haviland)

IMAGO: Head dark castaneous brown, with dense short hairs and long bristles, broadly oval; fontanelle broad, triangular; ocelli separated from the eyes by slightly more than their diameter; antennae with 15 articles, the third indistinctly longer than the second; postclypeus very short, much shorter than half its width; pronotum triangular, with strongly converging sides; head length to tip of labrum 1.79, width 1.67; pronotum length 0.80, width 1.48. (Holmgren, 1913).

SOLDIER: Head light brownish yellow, almost round without nasus, the latter cylindrical, rather thick at base; dorsal profile concave; antennae with 13-14 articles, the third as long as or longer than the second; head length with nasus 2.03(2.10)-2.18(2.41), without nasus 1.08, width 1.12(1.14)-1.30(1.43); pronotum length 0.27(0.28-0.31), width (0.57-0.62)0.63. (Light & Wilson, 1936).

Genus *NASUTITERMES* Dudley

KEY TO THE SPECIES

Imagoes

1. Ocelli small, separated from the eyes by a distance equal to or more than or only slightly less than their long diameter... 2

   Ocelli large, separated from the eyes by a distance much less than their long diameter... 10

2. Ocelli separated from the eyes by a distance nearly twice their long diameter 3

   Ocelli separated from the eyes by a distance not exceeding one-and-a-half their long diameter... 5

3. *Length of forewing 13.50; pronotum width 1.80*; head ovate; antennae with 15 articles, the third somewhat longer than the second. (Holmgren, 1913)... ....**N. fuscipennis** (Haviland)

   Length of forewing 9.00-10.00; pronotum width 0.99-1.06... 4

4. *Head nearly as long as wide; the second, third and fourth antennal articles subequal*; head very dark brown, densely hairy, broadly

oval, narrowed anteriorly; ocelli separated from the eyes by more than double their long diameter; antennae with 15 articles; postclypeus very short; pronotum trapezoid, slightly emarginate posteriorly, with a T-shaped marking; head length to tip of labrum 1.49, width 1.37; pronotum length 0.68, width 1.06. (Holmgren, 1913)... ... ... **N. celebensis** (Holmgren)

Head distinctly longer than wide; the third antennal article slightly shorter than the second, the fourth much broader than the third and also longer; head dark castaneous brown, densely hairy, oval; fontanelle small, strip-shaped; pronotum straight anteriorly, rounded posteriorly; head length to tip of labrum 1.48, width 1.27-1.30; pronotum length 0.60, width 0.99-1.06; length of forewing with scale 9.00-10.00. (Kemner, 1934).... ... .**N. saleierensis** (Kemner)

5. Fontanelle slit-like, as long as or longer than the ocellus... 6
Fontanelle dot-like, not exceeding two-thirds the length of the ocellus... 7

6. *Fontanelle as long as the ocellus;* head dark brown; ocelli elliptical; eyes small, bulging, separated from the lower margin of the head by more than half their diameter; head length to tip of labrum 1.51, without mandibles 1.00, width 1.33; diameter of eye 0.36; ocellus length 0.14, width 0.12, distance from the eye 0.09; pronotum length 0.69, width 1.12. (Light & Wilson, 1936)... ... ...**N. taylori** Light & Wilson

Fontanelle about one-and-a-half times as long as the ocellus, elliptical, abruptly flaring anteriorly, terminating in two sharp lateral points; antennae with 14-15 articles, the second twice as long as the third, the latter shortest; eyes almost round; ocelli broadly oval; pronotum rusty brown, antero-lateral corners broadly rounded, slightly emarginate posteriorly; head length to tip of labrum 1.37-(1.54), without mandibles (0.88)-1.00, width (1.14)-1.25; length of fontanelle (0.18), width (0.07); long diameter of eye 0 31, short diameter 0.26, distance from the lower margin of the head 0.10; ocellus length (0.13)-0.15, width (0.09)-0.11, distance from the eye (0.10)-0.11; pronotum length (0.69)-0.71, width (0.98)-1.07. (Light & Wilson, 1936)... .... -... ...**N. marivelles** (Light & Wilson)

7. Large species; head length to tip of labrum 1.24-1.60, width 1.10-1.48... 8

Small species; head length to tip of labrum (1.04)-1.13, width (0.98)-1.04; head dark brown; fontanelle club-shaped; eyes round; ocelli broadly oval; antennae with 13 articles, the second slightly longer than the third, the latter shortest; pronotum deeply emarginate posteriorly, slightly indented anteriorly; head length without mandibles (0.70-0.78)0.82; fontanelle length 0.05-0.06; eye length (0.26-0.28)0.285, width (0.23-0.26), distance from the lower margin of the head 0.07; ocellus length (0.09)-0.10, width (0.06-0.07)0.08, distance from the eye (0.072-0.078)-0.08; pronotum length (0.41-0.46)0.49, width (0.78-0.79)-0.84. (Light & Wilson, 1936)... ... ...**N. mindanensis** (Light & Wilson)

8. *Head length to tip of labrum (1.24)-1.25, width 1.08(1.10)-1.15*; head brown, densely hairy, broadly oval; fontanelle dot-like; eyes round; ocelli broadly oval; antennae with 15 articles, the second almost one-and-a-half times as long as the third, the latter shortest; pronotum distinctly emarginate posteriorly; wings moderately hairy, scales densely hairy; head length without mandibles (0.82), diameter of eye (0.26), distance from the lower margin of the head (0.08); ocellus length (0.13), width (0.10), distance from the eye (0.11); pronotum length 0.53(0.57)-0.60, width 0.93 (0.96)-1.00. (Hozawa, 1915)... ... ...**N. parvonasutus** (Nawa)

Head length to tip of labrum 1.48-1.60, width 1.25-1.48... 9

9. *Wings strongly hairy; fontanelle triangular*; head dark castaneous brown, broadly oval; eyes almost round; ocelli broadly oval; pronotum deeply emarginate posteriorly; head length to tip of labrum (1.50)-1.60, without mandibles (0.91), width (1.30)-1.48; long diameter of eye (0.36), short diameter (0.31), distance from the lower margin of the head (0.07); ocellus length (0.14), width (0.08), distance from the eye (0.11); pronotum length (0.54)-0.68, width (1.11)-1.22. (Holmgren, 1913)... ... ...**N. ovipennis** (Haviland)

Wings sparsely hairy; fontanelle slit-like; head blackish brown to black; antennae with 15 articles, the third much shorter than the second; pronotum trapezoid, deeply incised behind; head length to tip of labrum 1.48, width 1.25; pronotum length 0.63, width 1.00. (Holmgren, 1913)... ... ...**N. regularis** (Haviland)

10. Fontanelle slit-like... 11

Fontanelle lenticular to triangular... 16

11. Head width 1.10-1.25 12

Head width 1.44-1.79... 13

12. *Ocelli separated from the eyes by their short diameter; pronotum distinctly emarginate posteriorly;* head castaneous brown; fontanelle elongated, conspicuous; antennae with 14-15 articles, in specimens with 14 articles the second as long as the third, in specimens with 15 articles, the second nearly twice as long as the third, the latter shortest; head length to tip of labrum 1.23-1.32, without mandibles 0.80-1.01, width 1.10-1.18; long diameter of eye 0.31-0.36, short diameter 0.29-0.34, distance from the lower margin of the head 0.35-0.44, distance between the eyes 0.83-0.88; ocellus length 0.14-0.17, width 0.08-0.11, distance from the eye 0.07-0.08; clypeus length 0.14-0.17, width 0.43-0.53; fontanelle length 0.11-0.14; pronotum length 0.44-0.52, width 0.79-0.94; length of forewings 8.82. (Ahmad, 1953)... ... ... **N. ceylonicus** (Holmgren)

Ocelli much closer to the eyes, almost touching them; pronotum slightly emarginate posteriorly; head light castaneous brown; clypeus not much shorter than half its width; antennae with 15 articles; head length to tip of labrum 1.33-1.48, width 1.18-1.25; pronotum length 0.57-0.65; pronotum width 0.92-1.10. (Holmgren, 1913) ... ...**N. acutus** (Holmgren)

13. *Head width 1.79;* head castaneous brown; thickly hairy, broadly oval; ocelli only slightly separated from the eyes; antennae with 15 articles, the third slightly longer than the second, the latter longer than the fourth; pronotum trapezoid, somewhat indented posteriorly; head length to tip of labrum 1.94; pronotum length 0.84; width 1.44; length of forewings 14.00 (Holmgren, 1913) ... ...**N. matangensis** (Haviland)

Head width up to 1.60... 14

14. Pronotum deeply incised posteriorly 15

Pronotum only slightly incised posteriorly; head dark brown, densely hairy, round; antennae with 14-16 articles, in specimens with 15 articles the second as long as the third and in specimens with 16 articles the second distinctly longer than the third; head length to tip of labrum (1.58), without mandibles (1.06), width 1.45-1.60; length of fontanelle 0.09; long diameter of eye (0.49), short diameter (0.47), distance from the lower margin of the head (0.10); ocellus length (0.18), width (0.14), distance from the eye (0.05); pronotum length (0.62)0.67-0.83, width (1.11)1.23-1.43. (Hozawa, 1915)... ... ... **N. takasagoensis** (Oshima)

15. *Head dark mahogony brown*, with long bristles; antennae with 15 articles, the third almost long as the second; head length to tip of labrum 1.66-1.69(1.80), without mandibles 1.11(1.17-1.19), width 1.50(1.53-1.58); long diameter of eye (0.54)0.55-(0.59), short diameter 0.45(0.47-0.49) distance from the lower margin of the head (0.09-0.11); ocellus length (0.18)-0.20, width (0.13)0.14-(0.15), distance from the eye (0.03-0.04)0.06; clypeus length (0.20). width (0.62); pronotum length 0.70-(0.78), width (1.24)1.25-(1.32). (Light & Wilson, 1936)... ... ...**N. luzonicus** (Oshima)

Head castaneous brown; antennae with 15 articles, the third slightly longer than the second; head length to tip of labrum 1.63, width 1.44-1.56; pronotum length 0.68, width 1.14-1.25. (Holmgren, 1913)... ... ...**N. matangensiformis** (Holmgren)

16. *Fontanelle Y-shaped*; head brown, round; eyes large, bulging, separated from the lower margin of the head by one-eighth of its own diameter: the third antennal article distinctly shorter than the second; head length to tip of labrum 1.45, without mandibles 1.03, width 1.25; diameter of eye 0.49; ocellus length 0.17, width 0.13, distance from the eye 0.03; pronotum length 0.61, width 1.04. (Light & Wilson, 1936)... ... ...**N. culasiensis** (Oshima)*

Fontanelle not Y-shaped (triangular, oval or oblong) 17

17. *Posterior margin of pronotum convex*; head brown, elongately oval; fontanelle oblong, slightly broader anteriorly, the third antennal article shorter than the second; postclypeus two-and-a-half times as wide as long; body length with wings 14.50-16.00, without wings 7.50-8.00; length of forewings 12.00-13.50. (Bugnion, 1912) ... ...**N. lacustris** (Bugnion)

Posterior margin of pronotum not convex, either straight or depressed 18

18. *Head width 1.20; ocelli separated from the eyes by their short diameter*; head castaneous brown; fontanelle narrowly oval; antennae with 15 articles, the second and third subequal; pronotum slightly emarginate anteriorly, shallowly but broadly emarginate posteriorly; head length to tip of labrum 1.30; long diameter of eye 0.35; pronotum length 0.55, width 0.90; length of forewings 9.00. (Snyder, 1933a)... ... ...**N. brunneus** Snyder

*Described under the name of *N. gracilis*

Head width 1.50-1.65; ocelli separated from the eyes by less than half their short diameter 19

19. *Head width 1.65*; head brown; fontanelle prominent, narrowly triangular, about three-fourths the length of the short diameter of the ocellus; eyes separated from the lower margin of the head by one-sixth their diameter; ocelli elliptical; the third antennal article much shorter than the second; pronotum yellowish brown; head length to tip of labrum 1.78, without mandibles 1.31; eye length 0.634, width 0.518; ocellus length 0.182, width 0.140, distance from the eye 0.040. (Light & Wilson, 1936)... ... ...**N. chapmani** Light & Wilson

Head width 1.50-1.53... 20

20. *Head dark brown; fontanelle oval, very conspicuous; the second antennal article distinctly longer than the third*; head broadly oval, densely hairy; antennae with 15 articles; ocelli separated from the eyes by less than half their short diameter; pronotum with a T-shaped yellow marking, densely hairy, slightly emarginate posteriorly; head width 1.50-1.53; pronotum length 0.70, width 1.37-1.40; length of forewings 12.60-13.00. (Hozawa, 1915)... ... ...**N. kinoshitae** (Hozawa)

Head light reddish brown; fontanelle short, nearly triangular, the second antennal article as long as the third; head length to tip of labrum 1.66, without mandibles 1.14, width 1.50; eye length 0.55, width 0.50; ocellus length 0.18, width 0.13, distance from the eye 0.04; pronotum length 0.84, width 1.32; length of forewings 13.60. (Light & Wilson, 1936)... ... ...**N. panayensis** (Oshima)

Soldiers

1. Nasus conical, nearly twice as thick at the base as in the middle... 2

Nasus distinctly cylindrical, less than twice as thick at the base as in the middle... ... .26

2. Small species, head length with nasus 1.23-1.25, width 0.72-0.74...3

Large species, head length with nasus 1.30-2.09, width 0.80-1.40...4

3. *Head yellow, sparsely hairy; antennae with 12-13 articles; dorsal profile straight except for a low bulge at the base of the nasus*; third antennal article somewhat longer than the second, the fourth distinctly shorter than the third; pronotum not indented anteriorly; head length with nasus 1.25, without nasus 0.65, width 0.72; pronotum width 0.38. (Holmgren, 1913)... ... ...**N. javanicus** (Holmgren)

Head smoky brown, with a dense coat of whitish hairs, antennae with 11 articles; dorsal profile distinctly convex, with a concavity at the base of the nasus; head length with nasus 1.23, without nasus 0.75 0.78, width 0.72-0.74. (Light & Wilson, 1936)... ... ...**N. mollis** Light & Wilson

4. Head length with nasus 1.80-2.09, width 1.24-1.41... 5

Head length with nasus less than 1.80, width up to 1.20... 7

5. *Nasus relatively long, difference between the length of the head capsule and nasus length 0.36-0.48;* head orange brown; nasus darker at the base, basal hump indicated; mandibles with long apical portions; head length with nasus 1.80, without nasus 1.14, width 1.26; length of nasus 0.66, (Light & Wilson, 1936) ... ...**N. meridianus** Light & Wilson

Nasus relatively short; difference between the length of the head capsule and the nasus length appreciably more than 0.48... ...6

6. *Head with a dense coat of whitish hairs;* nasal hump slightly indicated; dorsal profile almost straight; antennae with 13 articles, the third nearly twice as long as the second and one-and-a-half times as long as the fourth; head length with nasus (1.88-1.95)1.98, without nasus 1.10, width at the base of the antennae (0.62-0.67), widest width 1.36(1.37-1.49); thickness of nasus in the middle (0.13-0.17), at the base (0.36-0.41); pronotum length (0.24-0.26), width (0.65). (Holmgren, K. & N., 1917) ... .**N. crassicornis** (Holmgren, K. & N.)

Head without hairs, brownish yellow, oval; nasal hump slightly indicated; antennae with 13-14 articles, in specimens with 14 articles the third shorter than the second, in specimens with 12 articles the third twice as long as the second; head length with nasus (1.95)2.01-(2.09), without nasus 1.10, width (1.24)1.36-(1.37) pronotum length (0.23-0.27), width (0.57-0.67). (Holmgren, 1913) ... ...**N. matangensis** (Haviland)

7. Head yellow or reddish yellow or brownish yellow... 8

Head brown to black... 16

8. Head yellow to orange coloured... 9

Head darker 10

9. *Mandibles without free apical portion*; head orange coloured, with a few scattered hairs; nasus conical; dorsal profile almost straight; antennae with 13 articles, the third one-and-a-half times as long as the second and twice as long as the fourth; pronotum not indented anteriorly; head length with nasus 1.48, without nasus 0.95-0.99, width at the base of the antennae (0.52), widest width 0.95-(1.02); length of nasus (0.46), thickness in the middle (0.13), at the base (0.33); pronotum length (0.18), width (0.53-0.57). (Holmgren, 1914) .. ..**N. acutus** (Holmgren)*

Mandibles with small apical portions; head yellow to orange; dorsal profile weakly sinuous; head length with nasus 1.44-1.61, without nasus 0.84-1.06, width 0.84-1.02. (Light & Wilson, 1936)... ... ...**N. culasiensis** (Oshima)

10. *Abdominal tergites densely pubescent*, with a row of bristles at the posterior margin; head yellowish brown, with a few long bristles mixed with microscopic hairs; dorsal profile almost straight; head length with nasus (1.57)-1.75, without nasus 1.10, width (0.96)-1.10; thickness of nasus in the middle (0.15), at the base (0.37); pronotum length (0.20)-0.25, width (0.52)-0.60. (Snyder, 1934) ... ...**N. emersoni** Snyder

Abdominal tergites not densely pubescent; hairs scattered or absent... 11

11. Head length with nasus 1.63-1.75... 12

Head length with nasus up to 1.52... 13

12. *Abdominal tergites with a row of long bristles at the posterior margin; antennae with 13 articles*; head light reddish brown, with a few scattered bristles; nasus strongly conical, without basal hump; dorsal profile straight; second antennal article as long as the third, the fourth shorter than the third; head length with nasus (1.63) 1.67-1.74, without nasus 0.91, width at the base of the antennae (0.57), widest width (1.04)1.10-(1.11); thickness of nasus in the middle (0.15), at the base (0.39); pronotum width 0.49-(0.57) (Holmgren, 1913)... ... ...**N. matangensiformis** (Holmgren)

Abdominal tergites without bristles at the posterior margin; antennae with 14 articles; head brownish yellow; dorsal profile slightly depressed below the middle; head length with nasus 1.75, without nasus 0.91, width 1.06; pronotum width 0.53. (Holmgren, 1913) .. ..**N. fuscipennis** (Haviland)

*Described under the name of *Eutermes (Eutermes) buitenzorgi*.

13. Abdominal tergites rust yellow... 14

Abdominal tergites pale yellow... 15

14. *Head seen from above produced behind;* dorsal profile straight; antennae with 12 articles; head length with nasus 1.47, without nasus 0.90, width 0.90; length of nasus 0.57. (Light & Wilson, 1936)... ... ...**N. oshimae** Light & Wilson

Head not produced behind; dorsal profile almost straight; antennae with 12 articles, the third longer than the second and fourth; head length with nasus 1.53, without nasus 0.96, width 0.99. (Light & Wilson, 1936)... ... ... **N. chapmani** Light & Wilson

15. *All abdominal tergites with a row of bristles at the posterior margin;* head brownish yellow, with a few widely scattered bristles; nasus distinctly conical, with an indistinct basal hump; dorsal profile straight; antennae with 12-13 articles, the second slightly shorter than the third, the latter one-and-a-half times as long as the fourth; head length with nasus (1.47)-1.48, without nasus 0.76 width at the base of the antennae (0.49), widest width (0.80-0.85); thickness of nasus in the middle (0.10), at the base (0.28); pronotum length (0.18-0.20), width (0.41)0.42-(0.44). (Holmgren, 1913)... ... ... **N. havilandi** (Desneux)

Only the hind abdominal tergites with bristles at the posterior margin! head reddish yellow; antennae with 13 articles; abdominal tergites rust yellow; head length with nasus 1.52, without nasus 0.76, width 0.91; pronotum width 0.49. (Holmgren, 1913)... ... ...**H. timoriensis** (Holmgren)

16. Nasus with a distinct basal hump... 17

Nasus without or with an indistinct, low basal hump... 23

17. Head width 1.02-1.13 18
Head width up to 0.99 19

18. *Third antennal article twice as long as the second; apical portion of the mandible short, thick, with an indistinct denticle;* head dark brown, with a few bristles, seen from above broadly rounded; antennae with 13 articles; head length with nasus 1.52-1.66, without nasus 1.06-1.09, width 1.02-1.13; pronotum length 0.28-0.29, width 0.49. (Kemner, 1934)... ... .**N. makassarensis** (Kemner)

Third antennal article one-and-a-half times as long as the second; apical portion of the mandible long, slender, without indication of any denticle; head dark brown, round; nasus slightly reddish; antennae with 13 articles; head length with nasus 1.35-1.66, without nasus 0.99-1.02, width 1.02-1.06; pronotum length 0.18-0.21, width 0.49-0.52. (Kemner, 1934)... ... ...**N. boengensis** (Kemner)

19. Head capsule oval, distinctly narrowed anteriorly... 20

Head capsule round... 21

20. *Antennal foveolae not visible in the dorsal view*; head chestnut coloured, with three or four long bristles; antennae with 13 articles, third slightly longer than the second and one-and-a-half times as long as the fourth; head length with nasus 1.39-1.53, without nasus 0.91-1.02, width 0.84(0.88)-0.99 (1.00); thickness of nasus in the middle (0.14), at the base (0.33) pronotum length (0.18-0.21), width (0.46). (Light & Wilson, 1936)... ....**N. simulans** Light & Wilson*

Antennal foveolae invisible in dorsal view; head dark brown; antennae with 13 articles, the third one-and-a-half times as long as the second, the latter as long as the fourth; abdominal tergites with a few long bristles at the posterior margin; head length with nasus (1.35-1.37)1.39-1.42, without nasus 0.93-0.95, width(0.85-0.88) 0.90-0.91, thickness of nasus in the middle (0.13), at the base (0.31); pronotum length (0.19), width (0.46). (Light & Wilson, 1936)... ... ...**N. latus** Light & Wilson

21. *Nasus as long as head capsule*; head dark brown; nasus conical; apical portions of the mandibles very prominent; basal hump of the nasus not very conspicuous; antennae with 13 articles, the third one-and-a-half times as long as the second and fourth; head length with nasus 1.44-(1.46), without nasus 0.72; width at the base of the antennae (0.52) widest width 0.87-(0.91); pronotum length (0.18), width 0.42-(0.46). (Holmgren, 1913)... ... ...**N. celebensis** (Holmgren)

Nasus much shorter than the head capsule... 22

22. *Larger species; head length with nasus 1.55-1.56, width 1.02-1.06*; head dark brown, with 4 bristles; nasus conical; antennae with 13 articles, the third one-and-a-half times as long as the second,

*Some specimens of this species have round head.

the fourth slightly shorter than the second; head length without nasus 0.99-1.02; pronotum length 0.18-0.21, width 0.49-0.52. (Kemner, 1934)... ....**N. boengiensis** (Kemner)

Smaller species; head length with nasus 1.31(1.32)-1.41, width 0.81 (0.83)-0.92; head reddish brown, nasus of the same colour as the head; dorsal profile straight; antennae with 13 articles, the third slightly longer than the second; mandibles with long conspicuous apical portion; thickness of nasus in the middle (0.11), at the base (0.26); pronotum length (0.15)-0.20, width 0.42(0.43)-0.49. (Kemner 1934)... ... ...**N. saleierensis** (Kemner)

23. *Head width 0.81-0.91, length with nasus 1.36-1.52;* head light brown; mandibles with short apical portion; third antennal article nearly twice as long as the second or fourth; head length without nasus 1.04. (Light & Wilson, 1936)... ....**N. panayensis** (Oshima)
Head width 0.96-1.19, length with nasus 1.56-1.79... 24

24. *Nasus only slightly conical, with a tendency towards becoming cylindrical;* head dark reddish brown, almost black; nasus without basal hump; dorsal profile straight; antennae with 13 articles, the second as long as the third, the fourth shortest; head length with nasus (1.56-1.61)1.63-1.67, without nasus 0.84, width (0.96-0.98) 1.03-1.07; pronotum length (0.18), width (0.46-0.49). (Holmgren,1913) ... ...**N. lacustris** (Bugnion)

Nasus distinctly conical... 25

25. *Nasus comparatively long, difference between the length of the head capsule and the length of the nasus 0.14-0.34;* head blackish brown, with a few hairs; dorsal profile almost straight except for an indistinct concavity at the base of the nasus; antennae with 12-14 articles, in specimens with 13 articles the second one-and-a-half times as long as the third, the latter shortest; head length with nasus 1.61-1.70(1.71), without nasus 0.87-0.92; width 1.03-1.11(1.19); pronotum length (0.23), width 0.46(0.54)-0.63. (Hozawa, 1915)... ... ...**N. takasagoensis** (Oshima)

Nasus comparatively short; difference between the length of the head capsule and the length of the nasus 0.44-0.54; head dark brown; nasus with a low basal hump in some specimens; dorsal profile straight; antennae with 13 articles, the third twice as long as the second; abdominal tergites brownish, with a few long bristles at the posterior margin; head length with nasus 1.56(1.71)-1.74

(1.79), without nasus 0.99-1.14, width 1.02(1.06)-1.17; thickness of nasus in the middle (0.14), at the base (0.33); pronotum length (0.23-0.26), width (0.52-0.57). (Light & Wilson, 1936) ... ...**N. luzonicus** (Oshima)

26. Soldiers dimorphic... 27

Soldiers monomorphic... 28

27. *Larger species;* MAJOR SOLDIER: nasus considerably long; dorsal profile almost straight; antennae with 14 articles, the third longer than the second; head length with nasus 2.50-2.55, without nasus 1.33-1.41, width 1.63; pronotum width 0.76; MINOR SOLDIER: antennae with 13 articles; head length with nasus 2.09, without nasus 1.10, width 1.18; pronotum width 0.65. (Holmgren, 1914)... ... ...**N. bulbiceps** (Holmgren)

Smaller species; MAJOR SOLDIER: head yellowish brown, with microscopic hairs; nasus long, cylindrical, with numerous minute hairs; antennae with 13 articles, third twice as long as the second, the fourth slightly shorter than the second; head length with nasus 2.26-2.31(2.43), without nasus 1.33, width (1.43-1.45)1.48; pronotum length (0.23), width (0.59)-0.61; MINOR SOLDIER: nasus with a very low basal hump; antennae with 13 articles; head length with nasus (1.87-1.89)1.90, without nasus 0.87, width 1.01(1.10-1.15); pronotum length (0.20), width (0.54)-0.57. (Holmgren, 1913)... ... ...**N. longinasus** (Holmgren)

28. Mandibles without or with only minute apical portion... 29
Mandibles with long prominent apical portion... 33

29. Head length with nasus 1.20-1.41... 30

Head length with nasus 1.70-1.90... 32

30. *Apical portion of the mandibles completely absent;* head light smoky brown; nasus with a low basal hump; antennae with 11 articles; head length with nasus 1.41, without nasus 0.87, width 0.87; length of nasus 0.54. (Light & Wilson, 1936)... ... ...**N. mindanensis** (Light & Wilson)

Apical portion of the mandibles minute... ... .31

31. *Head with a distinct constriction behind the antennae, apical portion of the mandibles comparatively prominent; head with a few short whitish hairs,* smoky brown; nasus with a distinct basal hump; dorsal

profile sinuous; antennae with 12 articles, the second one-and-a-half times as long as the second; head length with nasus (1.24-1.37) 1.45, without nasus 0.94, width (0.65-0.72)0.81; pronotum length (0.13-0.15), width (0.33-0.39). (Light & Wilson, 1936) ... ...**N. marivelles** (Light & Wilson)

Head without constriction behind the antennae; apical portion of the mandibles comparatively small; head covered with a dense coat of delicate whitish hairs, with a few scattered bristles; nasus with a prominent basal hump; head length with nasus 1.20, without nasus 0.76, width 0.69. (Light & Wilson, 1936)... ... ... **N. parvus** Light & Wilson

32. *Larger species; head length with nasus 1.90, without nasus 1.15, width 1.20; apical portion of the mandibles minute;* head yellowish; with short hairs and bristles; dorsal profile slightly depressed at the base of the nasus; molar region of the mandibles protruding anteriorly; antennae with 12-13 articles, the third longer than the second; pronotum emarginate anteriorly; nasus length 0.75; pronotum width 0.50. (Snyder, 1933a)... ....**N. anamalaiensis** Snyder

Smaller species; head length with nasus 1.70, without nasus 1.00, width 1.00; apical portion of the mandibles absent; head yellowish brown, with two long bristles at the vertex and two short bristles at the base of the nasus; dorsal profile straight; antennae with 13 articles, the third nearly twice as long as the second; pronotum notched anteriorly, shallowly emarginate posteriorly; length of nasus 0.70; pronotum length 0.20, width 0.50. (Snyder, 1933a)... ... ...**N. gardneri** Snyder

33. *Head slightly constricted behind the antennae,* not produced behind, almost round without nasus, smoky yellow, covered with minute whitish hairs and scattered bristles; head length with nasus 1.32, without nasus 0.78, width 0.78; nasus length 0.54. (Light & Wilson, 1936) ... ... **N. balintauacensis** (Oshima)

Head not constricted behind the antennae... 34

34. Nasus as long as or longer than the head capsule... 35

Nasus shorter than the head capsule... 37

35. *Smaller species; head length with nasus 1.44(1.48-1.53);* head oval, light castaneous brown; nasus slightly darker, cylindrical, with indistinct basal hump; dorsal profile straight; antennae with 13

articles, the third almost as long as the second and distinctly longer than the fourth; tergites with numerous short hairs; head length without nasus 0.65, width (0.78)-0.80; pronotum length (0.17), width (0.36)-0.38(0.41). (Holmgren, 1913)... ... ...**N. parvonasutus** (Nawa)*

Larger species; head length with nasus 1.86-1.90... 36

36. *Nasus slightly longer than the head capsule;* antennae with 13 articles; head length with nasus 1.86, without nasus 0.91, width 0.99; pronotum width 0.46. (Holmgren, 1913)... ... ...**N. longirostris** (Holmgren)

Nasus as long as the head capsule; head yellow, round; distinctly cylindrical, without basal hump, with a thick circlet of hairs at the tip; dorsal profile slightly depressed; antennae with 13 articles, the third as long as or slightly longer than the second, the fourth shortest; head length with nasus (1.87-1.89)1.90, without nasus 0.95, width 1.10-(1.12); pronotum length (0.20), width (0.41-0.49)0.53. (Holmgren, 1913)... ... ...**N. ovipennis** (Haviland)

37. *Head width (1.11)-1.24;* head round; with a few scattered bristles; nasus cylindrical but with a tendency towards becoming conical, without basal hump, much shorter than the head capsule; antennae with 13 articles, the third twice as long as the second or fourth; head length with nasus (1.82)-1.94; pronotum length (0.20), width (0.52). (Silvestri, 1914)... ... ...**N. robratus** (Silvestri)

Head width not exceeding 1.06... 38

38. Nasus relatively short, difference between the length of the head capsule and the length of nasus 0.30... 39

Nasus relatively long, difference between the length of the head capsule and the length of nasus not exceeding 0.20... 40

39. *Head capsule slightly wider than long; apical portion of the mandible nearly half as long as the anterior margin of the molar area, strongly outcurved; head dull yellow, covered with a coat of whitish hairs; nasus with a very low basal hump,* strongly cylindrical; antennae with 12 articles, the third as long as the second; head length with nasus 1.62, without nasus 0.96, width 1.02; nasus length 0.66. (Light & Wilson, 1936)... ... ...**N. rotundus** Light & Wilson

*Described by Holmgren under the name of *Eutermes (E.) Watasei*

Head capsule slightly longer than wide; apical portion of the mandible three-fourths as long as the anterior margin of the molar area, not strongly outcurved; head smoky yellow sparsely hairy; nasus with a conspicuous basal hump; antennae with 12-13 articles; head length with nasus 1.62 without nasus 0.96, width 0.91; nasus length 0.66. (Light & Wilson, 1936) ... . **N. taylori** Light & Wilson

40. *Third antennal article shorter than the second;* nasus with an indistinct basal hump; dorsal profile almost straight; posterior abdominal tergites with a row of bristles; head length with nasus 1.82, without nasus 0.95, width 1.06; pronotum width 0.49. (Holmgren, 1913)... ... ...**N. regularis** (Haviland)

Third antennal article as long as or longer than the second... ...41

41. *Nasus almost as long as the head capsule*; the latter oval, light castaneous brown; nasus strongly cylindrical, slightly darker than the head, with a low basal hump; dorsal profile almost straight; antennae with 12 articles, the third one-and-a-half times as long as the second, the fourth as long as the third; abdominal tergites with short hairs and a row of bristles at the posterior margin; head length with nasus 1.63-(1.79), without nasus 0.91, width at the base of the antennae (0.46), in the middle 0.83-(0.89); thickness of nasus in the middle (0.90-1.10), at the base (0.13-0.16); pronotum length (0.16-0.17), width (0.48), (Holmgren, K. & N., 1917)... ... ... **N. indicola** (Holmgren, K. & N.)

Nasus shorter than the head capsule... 42

42. *Tip of nasus with a dense growth of short hairs;* head capsule almost round, with a few scattered hairs; nasus cylindrical, without basal hump; head length with nasus 1.69, without nasus 0.78, width 1.00. (Silvestri, 1914)... ....**N. moratus** (Silvestri)

Tip of nasus without dense growth of hairs... 43

43. *Head without hairs*, oval, yellow brown; nasus distinctly cylindrical without basal hump; dorsal profile concave; antennae with 13 articles, the third one-and-a-half times as long as the second, slightly shorter than the fourth; mandibles with very prominent apical portions; head length with nasus (1.52)1.63-(1.67), without nasus 0.87, width (0.83)0.91-(1.01); thickness of nasus in the middle (0.10), at the base (0.18); pronotum length (0.20), width (0.44)-0.48. (Holmgren, 1913)... ....**N. oculatus** (Holmgren)

Head with fine hairs... 44

44. *Nasus distinctly cylindrical*, head light castaneous brown, oval, with a few long scattered bristles; nasus with a distinct but not prominent basal hump; dorsal profile almost straight; antennae with 12-13 articles, in specimens with 13 articles the third nearly one-and-a-half times as long as the second, abdominal tergites densely hairy; head length with nasus (1.50)-1.56, without nasus 0.86-0.88, width at the base of the antennae (0.75), in the middle (0.83)-0.93; nasus length 0.66-0.68, thickness in the middle (0.10), at the base (0.15); pronotum length (0.20), width 0.49. (Light & Wilson, 1936)... ... ...**N. castaneous** (Oshima)

Nasus rather thick at the base, with a tendency towards becoming conical... 45

45. *Head capsule round, nasus with a distinct basal hump;* head reddish brown, with a few scattered hairs; antennae with 12-13 articles; pronotum not emarginate either anteriorly or posteriorly; head length with nasus (1.30)1.41-(1.48), without nasus 0.79, width at the base of the antennae (0.50-0.57), in the middle 0 80-(0.83); thickness of nasus in the middle (0.11-0.14), at the base (0.20-0.23); height of basal hump (0.08); pronotum length 0.23, width 0.42(0.44-0.46) (Holmgren, 1913) ... ... **N. ceylonicus** (Holmgren)

Head capsule oval; nasus with a law basal hump; head light cataneous brown, scantily hairy, third antennal article slightly longer than the second, fourth as long as the third; tergites brownish yellow; head length with nasus (1.50)1.52-(1.56), without nasus 0.84, width at the base of the antennae (0.49-0.52), in the middle 0.91(0.96-0.98), thickness of nasus in the middle (0.10), at the base (0.18); pronotum length (0.20-0.23); width (0.46-0.52)0.57. (Holmgren, K. & N., 1917) ... ...**N. fletcheri** (Holmgren, K. & N.)

Genus *CEYLONITERMES* Holmgren

Single species: **Ceylonitermes escherichi** (Holmgren)

SOLDIER : Head pumpkin-shaped, constricted behind the antennae, light brownish yellow, with a few scattered bristles; nasus cylindrical, with a low but distinct basal hump; dorsal profile concave; antennae with 12 articles, the third nearly twice as long as the second and slightly longer than the fourth; pronotum slightly indented anteriorly; head length with nasus (1.17-1.22)1.41, without nasus 0.67, width at the base of the antennae (0.39), in the middle 0.53-(0.54), thickness of nasus in the middle (0.07), at the base (0.11-0.13); pronotum width (0.34). (Holmgren, 1913).

Genus *TRINERVITERMES* Holmgren

KEY TO THE SPECIES

Imagoes

1. *Pronotum only slightly wider than long;* head light castaneous brown, densely hairy; fontanelle three-cornered; ocelli separated from the eyes by less than their short diameter; antennae with 15 articles, the third longer than the second; pronotum slightly notched in the middle anteriorly, emarginate posteriorly; head length to tip of labrum 2.20, width 1.30; long diameter of eye 0.50; pronotum length 1.10, width 1.30 (Snyder, 1934) ... ... **T. indicus** (Snyder)

   Pronotum one-and-a-half to nearly twice as wide as long... 2

2. *Pronotum width 1.67, head width 1.79;* head dark brown; fontanelle three-cornered; ocelli separated from the eyes by half their diameter; antennae with 16 articles, the third as long as or a little longer than the second; pronotum light yellow with brownish tinge, emarginate posteriorly; head length to tip of labrum 2.09, pronotum length 0.87. (Holmgren, 1913) ... ... **T. heimi** (Wasmann)

   Pronotum width 1.30-1.44, head width 1.48 3

3. *Wings with a distinct subcostal stripe; median without anterior branches; pronotum not indented posteriorly; abdominal sides reddish;* head broadly oval, dark brown, thickly hairy; antennae with 15 articles, rarely with 16 articles, in specimens with 15 articles the third one-and-a-half times as long as the second, the latter slightly shorter than the fourth; head length to tip of labrum 1.82-1.92; without mandibles (1.09), width 1.48(1.53)-1.59; diameter of eye (0.39), distance from the lower margin of the head (0.09); ocellus length (0.20), width (0.16), distance from the eye (0.05); pronotum length 0.80-(0.85), width (1.30)1.33-1.43. (Holmgren, 1913) ... **T. rubidus** (Hagen)

   Wings with very indistinct subcostal stripe; median with short anterior branches; pronotum slightly indented posteriorly; abdominal sides whitish; head length to tip of labrum 1.79, width 1.63; pronotum length 0.80, width 1.44. (Holmgren, 1913)...**T. biformis** (Wasmann)

Major Soldiers

1. *Head length with nasus 2.50.2.70; head light* castaneous brown, with fine microscopic hairs; nasus darker than the head, with reddish tinge; antennae with 13-14 articles, the third longer than the second; pronotum shallowly emarginate anteriorly; head length without

nasus 1.65, width 1.65-1.70; pronotum length 0.30-0.35, width 0.80-0.90. (Snyder, 1934) ... ...**T. indicus** (Snyder)

Head length with nasus up to 2.49 2

2. *Antennae with 14 articles*; head light castaneous brown; nasus cylindrical, without basal hump; third antennal article slightly longer than the second; head length with nasus (2.28)2.36-(2.49), without nasus 1.41, width (1.37-1.45)1.52; pronotum length (0.26), width (0.65)-0.72 (Holmgren, 1913) ... ... **T. heimi** (Wasmann)

Antennae with 12-13 articles 3

3. *Head length with nasus 1.90-2.13; without nasus 1.03-1.10, width 0.91-1.10; third antennal article almost twice as long as the second;* head light reddish brown, covered with a thick coat of microscopic hairs, nasus with a sallow concavity at the base; pronotum width 0.49-0.61. (Holmgren, 1913)... ... ... **T. rubidus** (Hagen)

Head length with nasus (2.31)-2.32, without nasus 1.41, width (1.30)-1.44, third antennal article two-and-a-half times as long as the second; nasus with a deep concavity at the base; pronotum width (0.61). (Holmgren, 1913) ... ... **T. biformis** (Wasmann)

Minor Soldiers

1. *Head length without nasus 1.05;* head brown, with short hairs; nasus slightly darker than the head; antennae with 12 articles, the third three times as long as the second; thorax and abdomen brown; head length without nasus 1.80, width 0.80; pronotum length 0.25, width 0.55. (Snyder, 1934) ... ... **T. indicus** (Snyder)

Head length without nasus 0.65-0.80 2

2. *Head length with nasus 1.41, without nasus 0.65, width 0.61;* head light reddish brown, elongately oval, rather parallel-sided; nasus with a slight depression at the base, longer than the head capsule; antennae with 12-13 articles, the third twice as long as the second and as long as or slightly longer than the fourth. (Holmgren, 1913) ... ... **T. rubidus** (Hagen)

Head length with nasus 1.63-1.74, without nasus 0.80, width 0.72-0.74 3

3. *Fourth antennal article as long as or only slightly shorter than the third;* head reddish brown; nasus darker; head length with nasus 1.63, without nasus 0.80, width 0.72; pronotum width 0.61. (Holmgren, 1913) ... ... **T. biformis** (Wasmann)

Fourth antennal article much shorter than the third; head yellow; nasus darker; antennae with 13 articles, the third three times as long as the second; head length with nasus 1.71-(1.74), without nasus 0.80, width 0.68-0.70(0.74); length of the third antennal article (0.26), length of the fourth (0.15); pronotum length (0.21), width (0.44)-0.49. (Holmgren, 1913) ... . **T. heimi** (Wasmann)

Genus *SUBULITERMES* Holmgren

KEY TO THE SPECIES

Soldiers

1. *Head seen from above round;* head light yellow; nasus longer than the head capsule, cylindrical, with a depression at the base; antennae with 12 articles, the third twice as long as the second, the latter somewhat shorter than the fourth; head length with nasus 1.90, without nasus 0.87, width 1.03; pronotum width 0.49. (Holmgren, 1913)... ... ...**S. hantanae** (Holmgren)

   Head seen from above broadly oval... 2

2. *Head length with nasus 1.10, without nasus 0.49, width 0.61;* head yellow with a brownish tinge, with microscopic hairs; dorsal profile straight; antennae with 12 articles, the third shorter than the second. (Holmgren, 1913)... ....**S. aciculatus** (Haviland)

   Head length with nasus 1.35-1.63, without nasus 0.76-0.96, width 0.72-0.84... 3

3. Nasus distinctly shorter than the head capsule... 4
   Nasus slightly longer than the head capsule... 5

4. *Mandible with a minute point in the middle of the anterior margin of the molar area;* head orange coloured; nasus slightly darker than the head, cylindrical, with a low basal hump; antennae with 12 articles, the third slightly shorter than the second and as long as the fourth; head length with nasus (1.35)1.38-(1.44)1.49, without nasus 0.92-0.96, width (0.72)0 74-(0.75); pronotum length 0.15-(0.18 , width (0.33-0.36)0.41. (Kemner, 1934)... ... ...**S. javanellus** Kemner

   Mandible without any point on the margin of the molar area; head orange coloured; nasus slightly darker than the head, with a low basal hump; antennae with 12 articles, the third nearly as long as the second; head length with nasus (1.45)1.46-(1.47), without nasus 0.84, width (0.78) 0.80(0.81); pronotum length (0.15), width (0.39)-0.41. (Holmgren, 1914).... ....**S. leucops** (Holmgren)

5. *Third antennal article longer than the second*; nasus cylindrical, with a low basal hump; antennae with 12 articles, the third as long as the fourth; head length with nasus (1.44)-1.56, without nasus 0.72, width (0.78)-0.80; pronotum width 0.42. (Holmgren, 1913) ... ...**S. inaniformis** (Holmgren)

Third antennal articles as long as the second; head yellow, without hairs; dorsal profile almost straight; antennae with 12 articles; head length width nasus 1.63, without nasus 0.76, width 0.84; pronotum width 0.46. (Holmgren, 1913)... ... ...**S. inanis** (Haviland)

Genus *PROTOHAMITERMES* Holmgren

Single species: **Protohamitermes globiceps** Holmgren

IMAGO: Head dark brown, densely hairy; fontanelle situated behind the middle, large; eyes bulging; ocelli small, separated from the eyes by more than their diameter; antennae with 14 articles; pronotum straight anteriorly, slightly emarginate posteriorly; head length to tip of labrum 1.44-1.63, width 1.33-1.41; pronotum length 0.61, width 1.06-1.10. (Holmgren, 1913)

Genus *EURYTERMES* Wasmann

KEY TO THE SPECIES

Imagoes

1. *Postclypeus half as long as wide;* head dark brown, densely hairy; antennae with 15 articles, the third much shorter than the second; pronotum halfmoon-shaped, slightly emarginate posteriorly; head length to tip of labrum (1.09)1.22-(1.27), without mandibles (0.72-0.78), width 0.91-1.09)1 14; long diameter of eye (0.23-0.26) short diameter (0.23), distance from the lower margin of the head (0.09); ocellus length (0.10-0.11), width (0.07-0.08), distance from the eye (0.07-0.08); pronotum length (0.44)-0.57, width (0.83)-1.03. (Holmgren, 1913)... ... ...**E. assmuthi** Wasmann

Postclypeus shorter than half its width; fontanelle very prominent; head length to tip of labrum 1.37, width 1.22-1.25; pronotum length 0.65, width 1.18. (Holmgren, 1913)... ... ...**E. ceylonicus** Holmgren

Soldier

Eurytermes assmuthi Wasmann

Head light yellow, cylindrical, thick; antennae slender, the second, article thicker and large than the third; labrum triangular, not extending up to the middle of the mandibles; mandibles stoutly built; head length with mandibles 2.50, without mandibles 2.00, width 1.00. (Holmgren, 1913).

Genus *SPECULITERMES* Wasmann

Single species (from the Indomalayan region) : **S. cyclops** Wasmann

IMAGO: Head black, hairy, broadly oval, ocelli large, separated from the eyes by half their diameter; antennae with 15 articles; body length with wings 15.00-16.00, without wings 9.00-10.00. (Wasmann in Holmgren, 1913).

Genus *EUHAMITERMES* Holmgren

KEY TO THE SPECIES

Soldiers

1. *Head length with mandibles 2.01, without mandibles 1.44-1.54;* head yellow, rectangular, with thin short hairs; labrum broader than long with rounded anterior margin; mandibles short, stoutly built; third antennal article slightly shorter than the second; pronotum not indented anteriorly; head width 1.06; pronotum width 0.68. (Holmgren, 1913)... ... ...**E. hamatus** (Holmgren)

   Head with mandibles 2.40-2.51, without mandibles 1.70-1.90... ...2

2. *Mandibles only slightly shorter than half the length of the head capsule (difference, 0.15);* head yellow, with fairly long bristles and a mat of short hairs; mandibles stoutly built, strongly bowed, each with a pointed marginal tooth in the middle, antennae with 14 articles; head length with mandibles 2.40, without mandibles 1.70, width 1.29; pronotum length 0.40, width 0.65. (Snyder, 1933)... ... ...**E. lighti** (Snyder)

   Mandibles appreciably shorter than half the length of the head capsule (difference 0.34); head yellow, with scattered short hairs; antennae with 14 articles; head length with mandibles 2.51, without mandibles 1.90, width 1.14; pronotum width 0.72. (Holmgren, K. & N., 1917)... ... ... **E. indius** (Holmgren, K. & N.)

Genus *MICROCEROTERMES* Silvestri

KEY TO THE SPECIES

Imagoes

1. Ocelli dot-like, separated from the eyes by much more than their long diameter 2

   Ocelli larger, separated from the eyes by about their long diameter or less 3

2. *Postclypeus arched; second antennal article longer than the third and fourth combined; pronotum emarginate posteriorly;* head dark brown, moderately pubescent, parallel-sided; eyes round, bulging; ocelli separated from the eyes by twice their diameter; antennae with 14 articles, the third shortest; postclypeus brown, half as long as wide; head length to tip of labrum 1.01-1.17, without mandibles 0.77-0.84, width 0.83-0.89; long diameter of eye 0.18-0.21, short diameter 0.17-0.18, distance from the lower margin of the head 0.14-0.16; diameter of ocellus 0.05-0.06, distance from the eye 0.09-0.12; pronotum length 0.44-0.48, width 0.64 0.78. (Ahmad, 1955*a*) ... ... **M. tenuignathus** Holmgren

   Postclypeus flat; second antennal article as long as the third and fourth combined; pronotum not emarginate posterioly; head dark brown; antennae with 14 articles; postclypeus only slightly lighter in colour than the head; head length to tip of labrum 1.18-1.22, width 0.95-1.03; pronotum length 0.42-0.46, width 0.76-0.80. (Holmgren, 1913) ... ...**M. distans** (Haviland)

3. *Antennae with 13 articles;* head brownish yellow, sparsely hairy, oblong, thick; ocelli round; second antennal article one-and-a-half times as long as the third; postclypeus arched, less than half as long as wide; pronotum with anterior margin convex, with an indistruct notch in the middle, distinctly emarginate posteriorly; head length to tip of labrum 1.09, to side base of madibles 0.79, width 0.84; long diameter of eye 0.20, short diameter 0.16, distance from the lower margin of the head 0.13; diameter of ocellus 0.09, distance from the eye 0.09; pronotum length 0.42, width 0.77. (Ahmad, 1955*a*) ... ... **M. baluchistanicus** Ahmad

   Antennae with 14 articles... 4

4. *Head width 1.02-1.14; head black,* thickly hairy; fontanelle dot-like; second antennal article as long as the third and fourth combined; postclypeus slightly lighter than the head; pronotum trapezoid,

distinctly emarginate posteriorly head length to tip of labrum (1.22)1.23-1.34, without mandibles (0.91); long diameter of eye (0.26), short diameter (0.23), distance from the lower margin of the head (0.14); ocellus length 0.07, width (0.06), distance from the eye (0.08); pronotum length (0.39)-0.49, width 0.88-0.92. (Kemner, 1934) ... ...**M. depokensis** Kemner

Head width up to 0.9; head lighter in colour... 5

5. *Ocelli round;* head light reddish brown, moderately hairy; postclypeus more than half as long as wide; pronotum with a long median marking, not emarginate anteriorly, slightly emarginate posteriorly; head length to tip of labrum 1.08, without mandibles 0.78, width 0.88, long diameter of eye 0.20, short diameter 0.16, distance from the lower margin of the head 0.13; ocellus diameter 0.07, distance from the eye 0.08; pronotum length 0.39, width 0.65. (All measurements by the author)... ... .**M. los-banosensis** Oshima

Ocelli oval to suboval... 6

6. Postclypeus more than half as long as wide... 7

Postclypeus as long as or shorter than half its width... 9

7. *Ocelli separated from the eyes by their long diameter; pronotum distinctly emarginate posteriorly;* head light brown, with a few long bristles and more numerous short hairs; fontanelle small, round, situated a little below the level of the posterior margin of the eyes; second antennal article as long as the third and fourth combined; head length to tip of labrum 1.07-1.13, without mandibles 0.75-0.82, width 0.85-0.92; long diameter of eye 0.19-0.21 short diameter 0.16-0.17, distance from the lower margin of the head 0.11-0.13; ocellus length 0.07-0.10, width 0.06-0.07, distance from the eye 0.08-0.10; pronotum length 0.37-0.45, width 0.65-0.75. (Ahmad, 1955a)... ... ...**M heimi** Wasmann

Ocelli nearer to the eyes, separated by less than their short diameter; pronotum indistinctly emarginate posteriorly/ 8

8. *Mesonotum not notched posteriorly; large species;* eyes round; head length to tip of labrum (1.06)1.16-1.20, without mandibles (0.83), width 0.88 (0.91)-0.95; diameter of eye (0.20), distance from the lower margin of the head (0.12); ocellus length (0.09), width (0.07), distance from the eye (0.06); pronotum length 0.38(0.41)-0.46, width 0.60(0.65)-0.70. (Kemner, 1934)... ... ...**M. celebensis** Kemner

Mesonotum distinctly notched posteriorly, smaller species; head dark brown, with short dense hairs; eyes round; ocelli broadly oval; pronotum without emargination both anteriorly and posteriorly; metanotum slightly notched posteriorly; head length to tip of labrum (0.91)-0.93, without mandibles (0.67), width (0.78)-0.86; diameter of eye (0.18), distance from the lower margin of the head (0.09); ocellus length (0.08), width (0.06), distance from the eye (0.05); pronotum length 0.36-(0.44), width (0.57)-0.67. (Holmgren, 1913)... ... . **M. bugnioni** Holmgren

9. Ocelli separated from the eyes by their long diameter... 10

Ocelli separated from the eyes by nearly their short diameter... ...12

10. *Head width 0.64;* head with dense short hairs and scattered long bristles; fontanelle invisilbe; eyes not round; pronotum straight anteriorly, indistinctly emarginate posteriorly, longer than half its width; meso- and metanota shallowly but distinctly notched posteriorly; head length to tip of labrum 0.94; body length with wings 9.00; length of forewings 7.30. (Silvestri, 1923)... ... ...**M. annandalei** Silvestri

Head width 0.80-0.90... 11

11. *Head width 0.90; pronotum slightly less than one-and-a-half times as wide as long;* head castaneous brown, with dense, short hairs and long bristles; eyes not round, bulging, separated from the lower margin of the head by less than their long diameter; ocelli suboval, separated from the eyes by their length; postclypeus yellowish brown, twice as wide as long; antennae with 14 articles, the second as long as the third and fourth combined; pronotum of the same colour as the head, densely hairy, shallowly emarginate posteriorly; abdominal tergites brown, with a reddish tinge; head length to tip of labrum 1.20, long diameter of eye 0.20; pronotum length 0.50, width 0.70. (Snyder, 1934)... ....**M. cameroni** Snyder

Head width 0.80-0.85; pronotum slightly more than one-and-a-half times as wide as long; head dark castaneous brown, densely hairy; fontanelle not visible; antennae with 14 aricles, the second as long as the third and fourth combined; pronotum of the same colour as the head, straight anteriorly, indistinctly emarginate posteriorly; wings dark; head length to tip of labrum 1.05-1.10 (1.17), without mandibles (0.83); long diameter of eye 0.20, short diameter (0.18), distance from the lower margin of the head (0.13);

ocellus length (0.07), width (0.06), distance from the eye (0.08); pronotum length 0.40-(0.44), width 0.65-0.70. (Snyder, 1933a)... ... ...**M. beesoni** Snyder

12. *Mesonotum deeply notched posteriorly; fontanelle not visible;* head dark castaneous brown, densely hairy; antennae with 14 articles, the second as long as the third and fourth combined; postclypeus lighter in colour than the head; pronotum distinctly emarginate posteriorly; head length to tip of labrum 0.99, width 0.87; pronotum length 0.42, width 0.61. (Holmgren, 1913) .. .. **M. serrula** Holmgren

Mesonotum slightly emarginate posteriorly; fontanelle visible, dot-like; head brown, moderately pubescent; antennae with 14 articles, the second as long as the third and fourth combined; pronotum more densely pubescent than the head, slightly emarginate posteriorly; head length to tip of labrum (1.04)1.10-(1.17), without mandibles (0.76-0.83), width 0.82(0.83-0.90), eye length 0.175 (0.20-0.21), width (0.16-0.18), distance from the lower margin of the head (0.12-0.15); ocellus length (0.09-0.10), width (0.072), distance from the eye (0.072); pronotum length 0.44-0.45(0.46-0.49), width 0.60(0.67-0.71). (Snyder, 1933a)... ... ...**M. championi** Snyder

Soldiers

1. Mandibles shorter than half the length of the head capsule... 2

Mandibles as long as or longer than half the length of the head capsule... 5

2. *Mandibles indistinctly serrated;* head yellow, brownish anteriorly, sparsely hairy, cylindrical; antennae with 13 articles, the second twice as long as the third; labrum short, rounded apically, as long as wide; mandibles strongly concave in the outer half, stout; pronotum not indented anteriorly; head length width mandibles 2.25, without mandibles 1.63, width 0.92; pronotum width 0.61. (Holmgren, 1913)... ... .**M. bugnioni** Holmgren

Mandibles distinctly and coarsely serrated... 3

3. Head scantily hairy... 4

Head rather densely hairy, brownish yellow; labrum tongue-shaped, longer than wide; mandibles with incurved tips; abdominal tergites densely hairy; head length with mandibles 2.28, without

mandibles 1.63, width 0.87; pronotum width 0.53. (Holmgren, 1913)... ... ...**M. serrula** (Desneux)

4. *Smaller species;* head brownish yellow, with widely scattered hairs; frons strongly sloping, moderately depressed; labrum pentagonal, tongue-shaped; mandibles with incurved tips, irregularly and strongly serrated; head length with mandibles 2.47, without mandibles 1.71, width 0.95; pronotum width 0.65. (Holmgren, K. & N, 1917)... ... ...**M. fletcheri** Holmgren, K. & N.

Larger species; head brownish yellow, thinly hairy; frons depressed; labrum pentagonal, tongue-shaped; mandibles strongly serrated, stoutly built; pronotum not indented anteriorly; head length with mandibles 1.90, without mandibles 1.41, width 0.84; pronotum width 0.53. (Holmgren, 1913)... ... ...**M. greeni** Holmgren

5. *Mandibles only slightly shorter than the head capsule (difference between the length of the head capsule and the length of the mandibles 0.10-0.14);* head brownish yellow, with a few widely scattered bristles and short hairs; labrum about as long as wide, tip narrowly rounded; mandibles straight except the slightly bent tips, very finely serrated; postmentum with a few bristles at the tip and short hairs in the middle; pronotum slightly more hairy than the head, indistinctly emarginate posteriorly; head length with mandibles 2.18-2.36, without mandibles 1.14-1.25, width 0.88-0 96; postmentum length 0.66, width 0.30-0 33; pronotum length 0.29-0.33, width 0.55-0.59. (Ahmad, 1955a).... ....**M. longignathus** Ahmad

Mandibles distinctly shorter than the head capsule (difference between the length of the head capsule and the length of the mandibles 0.32-1.00)... 6

6. *Head capsule nearly two-and-a-half times* as long as wide, strongly cylindrical, yellowish brown, darker anteriorly; mandibles without serration; labrum very short, oval, not longer than wide; head length with mandibles 3.00, without mandibles 2.00. (Wasmann in Holmgren, 1913)... ... ...**M. cylindriceps** Wasmann

Head capsule less than twice as long as wide... 7

7. *Head capsule only slightly less than twice as long as wide (difference between the length and width 0.90);* head with scattered hairs; labrum broadly curved anteriorly, mandibles thick, strongly curved, coarsely serrated; head length with mandibles 2.94, without mandibles 1.90, width 1.00. (Silvestri, 1923)... ... ...**M. annandalei** Silvestri

Head capsule wider (difference between length and width not more than 0.67)... 8

8. Mandibles very finely and indistinctly serrated... 9
Mandibles coarsely and distinctly serrated particularly in the basal half... 15

9. Head length with mandibles 1.83-2.22, without mandibles 1.10-1.30... 10

Head length with mandibles 2.60-3.12, without mandibles 1.62-1.90 12

10. *Head capsule relatively broad, ratio of length to width 1.15-1.32;* brownish yellow, sparsely hairy, oblong, thick slightly narrowed anteriorly, sides slightly convex; postmentum about twice as long as wide, widest in the middle; antennae with 13 articles, the second one-and-a-half times as long as the third; labrum short, broadly curved apically, postero-lateral sides almost parallel; mandibles curved in the distal half, basal half with a rather distinct denticle; pronotum saddle-shaped, indistinctly emarginate both anteriorly and posteriorly; head length with mandibles 1.83-2.22, without mandibles 1.11-1.29, width 0.96-0.99; postmentum length 0.74-0.77, width 0.29-0.33; pronotum length 0.33, width 0.55-0.59. (Ahmad, 1955a).... ....**M. baluchistanicus** Ahmad

Head capsule relatively narrow, ratio of length to width 1.38-1.48...11

11. *Head length with mandibles 2.10-2.20, without mandibles 1.21-1.30; labrum wider than long; outer margin of mandibles only slightly convex, postmentum width widest about the middle;* head brownish yellow, sparsely hairy, only slightly narrowered anteriorly; second antennal article one-and-a-half times as long as the third; pronotum slightly emarginate posteriorly; head width 0.86-0.94; postmentum length 0.63-0.68, width 0.30-0.35; pronotum length 0.28-0.34, width 0.52-0.61. (Ahmad, 1955a).... ....**M. heimi** Wasmann

Head length with mandibles 1.90(1.97-2.03), without mandibles (1.10) 1.14-(1.20); labrum as long as wide; outer margin of mandibles rather distinctly convex; postmentum widest in the anterior half; head yellow, sparsely hairy, slightly narrowed anteriorly; second antennal article slightly longer than the second; labrum narrowly curved apically; head width (0.77)0.80-0.81; postmentum length 0.60-0.62, width 0.30-0.32; pronotum length (0.25-0.30), width 0.53(0.55-0.59). (Holmgren, 1913)... ... ...**M. tenuignathus** Holmgren

12. *Third antennal article only slightly shorter than the second; head length with mandibles 3.10(3.12);* head light castaneous brown, broadest anteriorly, with scattered hairs; labrum dome-shaped, broadly rounded apically; mandibles black, sickle-shaped, very finely serrated; pronotum notched anteriorly, not emarginate posteriorly; head length without mandibles (1.89)-1.90, width 1.10-(1.14); length of the left mandible (1.24)-1.30; postmentum length (1.09), widest width (0.31), narrowest width 0.20); pronotum length (0.39)-0.50, width 0.70-(0.75). (Snyder, 1934)... ... ...**M. crassus** Snyder

Third antennal article much shorter than the second; head length with mandibles up to 2.97... 13

13. *Labrum pointed apically, as long as wide; head width 1.17-1.26;* head testaceous anteriorly, lighter posteriorly, sparsely hairy, sides slightly curved; mandibles sabre-shaped, tips broadly curved, with a few notches in the posterior half, rest with indistinct serration; pronotum convex anteriorly, slightly emarginate, without emargination posteriorly, lateral angles pronounced, rounded; head length with mandibles 2.79-2.97, without mandibles 1.72-1.86; postmentum length 1.16-1.26, width 0.31-0.36; pronotum length 0.34-0.37, width 0.68-0.72. (Ahmad, 1947)... ... ...**M. philippinensis** Ahmad

Labrum not pointed anteriorly, broadly rounded or straight, wider than long... 14

14. *Mandibles strongly curved in the outer half, width in the middle 0.18;* head light cataneous brown, scantily hairy, almost rectangular; pronotum slightly notched anteriorly, slightly depressed posteriorly; head length with mandibles 2.60, without mandibles 1.62, width 1.04; length of the left mandible 1.04; postmentum length 0.80, widest width 0.33, narrowest width 0.23; pronotum length 0.33, width 0.70. (All measurements by the author) ... ... **M. los-banosensis** Oshima

Mandibles not very strongly curved in the outer half, narrower in the middle, width 0.14; head testaceous, rectangular, sides more or less parallel; mandibles stoutly built, rather sharply bent at the tip; serration indistinct; pronotum slightly notched anteriorly in the middle, lateral angles, rounded, pronounced; without emargination posteriorly; head length with mandibles 2.70-2.88, without

mandibles 1.62-1.71, width 1.01-1.12, postmentum length 1.00-1.26, width 0.33-0.36; pronotum length 0.32-0.36, width 0.65-0.69. (Ahmad, 1947)... ... ...**M. burmanicus** Ahmad

15. Mandibles relatively long, ratio of the length of the mandibles to the length of the head capsule 1.21-1.43... 16

Mandibles relatively short, ratio of the length of the mandibles to the length of the head capsule more than 1.43... 18

16. *Small species; head length with mandibles 1.98, without mandibles (1.02-1.04)1.18;* head yellow, sparsely hairy, rectangular, frons sloping; the second antennal article twice as long as the third; labrum pentagonal, pointed apically, reaching the basal third of the mandibles; the latter serrate in the basal two-thirds; pronotum indistinctly notched anteriorly; head width 0.76-(0.82); length of the left mandible (0.78); postmentum length (0.57), width (0.26); pronotum length (0.23), width (0.44)-0.46. (Holmgren, 1913) ... ...**M. havilandi** Holmgren

Large species; head length with mandibles 2.70-2.93, without mandibles 1.59-1.69 17

17. *Mandibles relatively short, ratio of the length of the mandibles to the length of the head capsule 1.42-1.43, narrower in the middle, width 0.18; head narrower, width 1.10-1.13; labrum not indented apically;* mandibles coarsely serrated in the basal two-thirds; head length with mandibles 2.72-2.83, without mandibles 1.59-1.66; pronotum width 0.56-0.60. (Kemner, 1934)... ... ...**M. medurae** Kemner

Mandibles relatively long, ratio of the length of the mandibles to the length of the head capsule 1.31-1.36, wider in the middle, width 0.20; head wider, width 1.20-1.27; labrum minutely indented apically, narrowly rounded; head brownish yellow, sparsely hairy, distinctly narrowed anteriorly; mandibles sabre-shaped, coarsely notched in the basal two-thirds; head length with mandibles 2.80-2.83, without mandibles 1.59-1.69; pronotum length 0.35-0.38, width 0.63-0.67. (Kemner, 1934) ... ...**M. depokensis** Kemner

18. *Head length with mandibles 2.00-2.01,* without mandibles 1.30-1.34, head light yellow, with scattered long bristles; pronotum slightly notched anteriorly, head width 0.80-0.85; length of the left mandible 0.80; pronotum length 0.20, width 0.60. (Snyder, 1934) ... ... **M. beesoni** Snyder

Head length with mandibles more than 2.20... 19

19. *Head length with mandibles 2.77, without mandibles 1.75, width 1.14;* head yellow brown, sparsely hairy, frons slightly sloping; fontanelle distinct; second antennal article as long as the fourth; labrum pentagonal, as long as wide; mandibles strongly bent, coarsely serrated; pronotum notched anteriorly; pronotum width 0.65. (Holmgren, 1913) ... ...**M. distans** (Haviland)

Head length with mandibles up to 2.67, without mandibles up to 1.67, width up to 1.09... 20

20. Pronotum markely notched anteriorly 21

Pronotum indistinctly notched anteriorly 22

21. *Larger species; head length with mandibles 2.55, without mandibles 1.65, width 1.00;* head yellow brown; mandibles irregularly serrated, with large denticles near the base; pronotum length 0.35, width 0.65. (Snyder, 1934)... ... ...**M. cameroni** Snyder

Smaller species; head length with mandibles 2.20-2.30(2.34), without mandibles 1.40(1.45)-1.50(1.58), width (0.83-0.88)0.90; head reddish yellow, sparsely hairy, parallel-sided; mandibles strongly bent, sickle-shaped; postmentum widest in the anterior half; pronotum indistinctly emarginate posteriorly; postmentum length (0.83-0.91). widest width (0.26-0.31), narrowest width (0.15-0.18); pronotum length 0.30(0.31-0.33), width (0.54)0.55-(0.57). (Snyder, 1933b) ... ...**M. championi** Snyder

22. *Ratio of the width to length of the head capsule 1.53-1.65; outer margin of the mandibles convex in the middle;* head yellow, rectangular; fontanelle distinct; mandibles stoutly built, tips hooked; labrum as long as wide, anterior margin pointed in the middle; head length with mandibles 2.42-2.62, without mandibles 1.59(1.61)-1.67, width 0.96-(1.01)1.09; postmentum length (0.93), widest width (0.31), narrowest width (0.23); pronotum length (0.36), width 0.60(0.62)-0.63. (Kemner, 1934)... ... ...**M. celebensis** Kemner

Ratio of the width to length of the head capsule 1.66-1.82; outer margin of the mandibles almost straight in the middle; head sparsely hairy, parallel-sided; labrum as long as wide, narrowly rounded; mandibles dark reddish brown, strongly hooked; postmentum widest in the anterior half; pronotum indistinctly emarginate posteriorly; head length with mandibles 2.29-2.55, without mandibles 1.48-1.58, width 0.81-0.95; postmentum length 0.81-0.88, width 0.29; pronotum length 0.29-0.33, width 0.55-0.59. (Ahmad, 1955a)... ... ...**M. sakesarensis** Ahmad

Genus *GLOBITERMES* Holmgren

KEY TO THE SPECIES

Imagoes

Ocelli separated from the eyes by half their diameter; head length to tip of labrum 1.37, width 1.18; pronotum length 0.65, width 0.99; head black brown; fontanelle distinct; head broadly oval; antennae with 15 articles, the third shortest; postclypeus distinctly shorter than half its width; pronotum straight anteriorly, emarginate posteriorly, with a T-shaped marking; wing membrane thinly hairy, length of forewing 9.50. (Holmgren, 1913)... ...**G. sulphureus** (Haviland)

Ocelli separated from the eyes by their diameter; head length to tip of labrum 1.10, width 0.99; pronotum length 0.46, width 0.80; head castaneous brown; fontanelle indistinct; postclypeus much shorter than half its width; antennae with 15 articles, the second as long as the third and fourth combined; length of forewing 7.00-7.50. (Holmgren, 1913)... ... ... **G. globosus** (Haviland)

Soldiers

1. Head capsule broader than long, broadly oval... 2
   Head capsule nearly as broad as long, rounded... 3

2. *Antennae with 15 articles; tooth of the mandible placed just behind the middle;* head brownish yellow, with a few scattered bristles; fontanelle located in the middle of the head, indistinct; head length with mandibles 1.41-1.52, without mandibles 0.65-0.80, width 0.76-0.95; pronotum width 0.49-0.61. (Holmgren, 1913)... ... ...**G. globosus** Haviland

   Antennae with 14 articles; tooth of the mandible more posteriorly placed; head length with mandibles 1.23-1.31, without mandibles 0.70, width 0.77-0.81; pronotum width 0.52-0.53. (Kemner 1934)... ... ...**G. vadaensis** Kemner

3. *Tooth of the mandible placed beyond the middle, directed laterally; larger species; head length with mandibles 2.23, without mandibles 1.17, width 1.20;* head yellowish; labrum long, dome-shaped; mandibles strongly curved apically. (Silvestri, 1914)... ... ... **G. audax** Silvestri

   Tooth of the mandible placed in the basal third, posteriorly directed; smaller species; head length with mandibles 1.82, without mandibles (0.98)-1.03, width 0.99-(1.04); head brownish yellow, with

scattered bristles; fontanelle very indistinct; antennae with 14 articles, the second slightly longer than the third, the latter longer than the fourth, in some specimens the second and third subequal; labrum longer than broad, rounded apically; pronotum without emargination both anteriorly and posteriorly; length of the left mandible (0.91), tooth from the base (0.33); postmentum length (0.28), width (0.23), pronotum length (0.36-0.41), width (0.70)-0.76(0.78). (Holmgren, 1913)... ... ...**G. sulphureus** (Haviland)

Genus *EREMOTERMES* Silvestri

KEY TO THE SPECIES

Imagoes

Larger species; head length to tip of labrum (1.09-1.11)1.24, width (0.83)0.84-(0.85); pronotum length (0.44)-0.46, width (0.73-0.75) 0.76; head length without mandibles (0.70-0.75), long diameter of eye (0.19-0.20), short diameter (0.15), distance from the lower margin of the head (0.12-0.13); ocellus length (0.091-0.096), width (0.078), distance from the eye (0.78); postclypeus length (0.24), width (0.39). (Holmgren, K. & N., 1917)... ... ...**E. fletcheri** Holmgren, K. &. N.

Smaller species; head length up to tip of labrum 0.95, width 0.76; pronotum length 0.34, width 0.65; head oval, somewhat arched, narrowed anteriorly; eyes not bulging; ocelli separated from the eyes by half their diameter. (Holmgren, K. & N., 1917)... ... ...**E. paradoxalis** Holmgren K. & N.

Soldiers

1. Head length with mandibles 1.98-2.07 2
   Head length with mandibles 1.62-1.79... 3

2. *Mandibles as long as the head capsule, tooth placed in the middle;* head reddish yellow, slightly darker anteriorly, with scattered bristles and short hairs; antennae with 14 articles, the second shorter than the third; head length with mandibles 1.98-(2.02), without mandibles (0.96)-0.99(1.04), width (0.83)-0.91; tooth of the left mandibles from the base (0.49); postmentum length (0.44), widest width (0.26), narrowest width (0.13); pronotum length (0.23), width (0.52)-0.57. (Holmgren, K. & N., 1917)... ... ...**E. fletcheri** Holmgren, K. & N.

   Mandibles slightly longer than the head capsule, tooth placed slightly below the middle; head yellow, with scattered bristles and short

hairs, hairs around the frontal projection rather dense, head oblong, slightly narrowed anteriorly, sides moderately convex; antennae with 14 articles, the second a little longer than the third, the latter longer than the fourth; labrum about as long as wide, with obtuse-angled tip, postero-lateral sides parallel; mandibles long, with broad base and slightly bent tip, inner margins at the base of the tooth deeply notched; postmentum twice as long as wide; pronotum saddle-shaped, twice as wide as long, slightly depressed in the middle posteriorly; head length with mandibles 2.01-2.07, without mandibles 0.94-1.03, width 0.81-0.85; postmentum length 0.51-0.59, width 0.25-0.29; pronotum length 0.22-0.25, width 0.44-0.51. (Ahmad, 1955a)... ...**E. maliki** Ahmad

3. *Mandibles longer than the head capsule, tooth placed in the middle;* head brownish yellow, scantily hairy; frontal projection with dense short hairs, head subrectangular, slightly narrowed anteriorly, widest about the middle; antennae with 13 articles, the second slightly longer than the third, the fourth shortest; labrum about as long as wide, pentagonal, pointed apically; mandibles long, slender, base broad and thick, tip slightly bent, outer margin depressed slightly below the middle, tooth minute; pronotum saddle-shaped, anterior lobe greatly pronounced, indistinctly emarginate both anteriorly and posteriorly; head length with mandibles 1.66-1.77, without mandibles 0.77-0.82, width 0.74-0.77; postmentum length 0.44, width 0.23-0.25; pronotum length 0.19-0.26, width 0.40-0.44. (Ahmad, 1955*a*) ... ... **E. neoparadoxalis** Ahmad

Mandibles as long as the head capsule, tooth more anteriorly placed; head light reddish brown, moderately hairy, frontal projection with numerous long bristles and short hairs, head subrectangular, sides slightly converging anteriorly, widest in the posterior half; antennae with 13 articles, the second one-and-a-half times as long as the third, the fourth shortest; labrum one-and-a-half times as wide as long, pentagonal, pointed apically; mandibles long, slender, base broad and thick, tip slightly curved, tooth minute but sharply pointed; pronotum indistinctly emarginate both anteriorly and posteriorly; head length with mandibles (1.62-1.72)1.79, without mandibles (0.80-0.88)0.95-1.03, width (0.71)-0.76(0.78); postmentum length (0.37-0.42), width (0.25-0.28); pronotum length 0.25-0.32, width (0.43-0.46). (Holmgren, 1913).....**E. paradoxalis** Holmgren

Genus *PROHAMITERMES* Holmgren

KEY TO THE SPECIES

Imagoes

Antennae with 15 articles; eyes flat; pronotum indented anteriorly, straight posteriorly; head castaneous brown, elongately oval; eyes large; ocelli separated from the eyes by more than their short diameter; pronotum lighter in colour than the head; head length to tip of labrum 1.22, width 0.95; pronotum length 0.46, width 0.91. (Holmgren, 1913) ... ...**P. mirabilis** (Haviland)

Antennae with 16 articles; eyes bulging; pronotum straight anteriorly and shallowly emarginate posteriorly; ocelli separated from the eyes by less than their long diameter; eyes small; body length with wings 7.75. (Holmgren, 1913)... ... ...**P. hosei** (Desneux)

Soldiers

Labrum triangularly pointed; mandibles slightly bent; antennae with 14 articles, smaller species; head yellow to brown yellow, with scattered bristles, oval; third antennal article slightly longer than the second, and distinctly longer than the fourth; pronotum slightly but distinctly emarginate anteriorly; abdominal tergites with a row of bristles at the hind margin; head length with mandibles (2.08)-2.34, without mandibles (1.24)-1.33, width (1.17)-1.22; postmentum length (0.78), width (0.33); pronotum length (0.41), width 0.65. (Holmgren, 1913)... ... ...**P. mirabilis** (Haviland)

Labrum tongue-shaped; mandibles strongly bent; antennae with 15 articles; larger species; the second, third and fourth antennal articles subequal; postmentum arched; pronotum distinctly indented anteriorly; head length with mandibles 2.85, without mandibles 2.09, width 1.82; pronotum width 1.14. (Holmgren, 1913) ... ... **P. hosei** (Desneux)

Genus *SYNHAMITERMES* Holmgren

KEY TO THE SPECIES

Soldiers

Mandibles curved in the middle; head light yellow, rectangular; antennae with 13 articles; the second longer than the third; labrum narrowly rounded anteriorly; postclypeus short; head length with mandibles 1.44, without mandibles 0.99, width 0.80; pronotum width 0.49. (Holmgren, 1913) ... ... **S. quadriceps** (Wasmann)

Mandibles uniformly curved; second antennal article about twice as

long as the third, the latter shortest; head length with mandibles (1.35)-1.37, without mandibles (0.82)-0.91, width (0.78)-0.80; postmentum length (0.49), width (0.26); pronotum length (0.31), width 0.49-(0.52). (Holmgren, 1913)... ...**S. ceylonicus** Holmgren

Genus *AMITERMES* Silvestri

KEY TO THE SPECIES

Imagoes

1. Ocelli *separated from the eyes by their short diameter, distance (0.07-0.09)*; head brown, densely hairy, round; fontanelle elongately oval; eyes round; slightly bulging; ocelli broadly oval; postclypeus nearly half as long as wide, with a faint median line, with a few long bristles and short hairs; pronotum subscordate, anterior margin slightly raised with an indistinct notch, slightly emarginate posteriorly; head length to tip of labrum 1.04-1.15, without mandibles 0.74-0.81, width 0.94-1.06; diameter of eye 0.21-0.25, distance from the lower margin of the head 0.09-0.12; ocellus length 0.10-0.14, width 0.07-0.09, pronotum length 0.48-0.58, width 0.71-0.85. (Ahmad, 1955*a*) ... ... **A. belli** (Desneux)

Ocelli nearer to the eyes, distance 0.026-0.027... 2

2. *Larger species; head length to tip of labrum (1.22), width (1.11)1.12-(1.14); pronotum 0.57-(0.59), width 0.91-(0.93)*; head ovate; eyes round; fontanelle elongately oval; antennae with 14-(15) articles pronotum uniformly coloured, without any marking, straight anteriorly, broadly bilobed posteriorly; head length without mandibles (0.76-0.78); diameter of eye (0.32-0.33), distance from the lower margin of the head (0.05-0.06); ocellus length (0.14), width (0.10), distance from the eye (0.026-0.027). (Holmgren, 1913) ... ... **A. dentatus** (Haviland)

Smaller species; head length to tip of labrum (1.01), width 0.98-(1.03) pronotum length (0.44)-0.49, width (0.72)-0.80; antennae with 14 articles, the second about twice as long as the third; head length without mandibles (0.70-0.72); long diameter of eye (0.31), short diameter (0.26-0.27), distance from the lower margin of the head (0.059); ocellus length (0.13), width (0.07-0.09), distance from the eye (0.026). (Holmgren, 1913)... ... ...**A. minor** Holmgren

Soldiers

1. Tooth of the mandible laterally directed... 2

Tooth of the mandible posteriorly directed; head yellow, sparsely hairy,

area around fontanelle rather densely hairy, thick, oblong; slightly narrowed anteriorly, widest in the posterior half; antennae with 14 articles, the second one-and-a-half times as long as the third, the fourth shortest; anteclypeus bilobed; labrum dome-shaped, slightly wider than long; mandibles thin, sickle-shaped, tooth placed in the middle; pronotum indistinctly emarginate both anteriorly and posteriorly; head length with mandibles 1.77-2.16 without mandibles 1.24-1.44, width 1.00-1.14; postmentum length 0.70-0.90, width 0.28-0.33; pronotum length 0.30-0.44, width 0.56-0.58. (Ahmad, 1955*a*)... ... ...**A. belli** (Desneux)

Tooth of the mandible laterally directed... 2

2. *Larger species; head length with mandibles 1.98-(2.08), without mandibles 1.41-(1.43); width (1.12-1.14)1.18*; head yellow; postclypeus strongly bilobed; labrum tongue-shaped; antennae with 14 articles, the second as long as or slightly longer than the third; the latter and the fourth subequal; mandibles strongly curved, tooth sharply pointed, laterally directed, posterior margin convex, anterior margin straight; postmentum length (0.78), widest width (0.31), narrowest width (0.23); pronotum width 0.65-(0.67). (Holmgren, 1913) ... ... **A. dentatus** (Haviland)

Smaller species; head length with mandibles 1.75-1.80, without mandibles 1.22-1.39, width 0.92-1.03 3

3. *Mandibles strongly curved;* head length with mandibles 1.78, without mandibles 1.22, width 0.99; pronotum width 0.57 ... ...**A. minor** (Holmgren)

Mandibles not strongly curved; head brownish yellow, with a few scattered bristles, frontal projection with numerous hairs; head widest in the posterior half; antennae with 14 articles, the second one-and-a-half times as long as the third; mandibles stoutly built, base broad and thick, tooth placed a little anterior to the middle, not sharply pointed; pronotum weakly emarginate anteriorly and posteriorly; head length with mandibles 1.75-1.80 (average 1.77), without mandibles 1.23-1.39 (average 1.30), width 0.92-1.03 (average 0.98); postmentum length 0.55-0.65, width 0.30-0.37, pronotum length 0.28-0.34, width 0.59-0.66. (Ahmad, 1955*a*) ... ... **A. paradenticulatus** Ahmad

Genus *TERMES* Linne

KEY TO THE SPECIES

Imagoes

1. *Second antennal article as long as the third;* head castaneous brown; fontanelle narrow; third and fourth antennal articles subequal; ocelli almost in contact with the eyes; pronotum with anterior margin slightly concave; meso-and metanota with posterior margin broadly lobed... ... ...**T. brevicornis** Haviland

   Second antennal article longer than the third... 2

2. Length of forewings 5.50-7.00; head length to tip of labrum less than 1.20 3

   Length of forewings 8.50; head length to tip of labrum 1.20; ocelli very close to eyes; pronotum shallowly concave anteriorly, emarginate posteriorly; body length with wings 10.00, without wings 6.50; head width 1.00; pronotum length 0.60, width 0.90. (Snyder, 1934) ... ... **T. marjoriae** (Snyder)

3. *Meso and metanota slightly indented posteriorly;* head light castaneous brown; eyes not quite round, converging dorsally; ocelli dot-like, almost touching the eyes; antennae with 15 articles, the second one-and-a-half times as long as the third, in some specimens only slightly longer; postclypeus half as long as wide; head length to tip of labrum (0.91-0.96) 0.99, to side base of mandibles (0.67-0.69), width (0.85)-0.87; long diameter of eye (0.31-0.33), short diameter (0.28-0.31), distance from the lower margin of the head (0.065); ocellus length (0.052-0.072), width (0.052-0.057), distance from the eye (0.015-0.020); pronotum length 0.38(0.41-0.44), width (0.67-0.69) 0.72. (Holmgren, 1913) ... ... **T. comis** Haviland

   Meso- and metanota deeply indented posteriorly; fontanelle narrow; ocelli in contact with the eyes; antennae with 15 articles, the third much shorter than the fourth; body length without wings 4.50, length of forewings 5.50. (Holmgren, 1913)...**T. rostratus** Haviland

Soldiers

1. *Frontal projection seen laterally small, rounded;* head whitish yellow, antennae with 14 articles, the second slightly shorter than the third, the third and fourth subequal; mandibles strongly hooked; head length with mandibles 3.00, up to side base of mandibles (1.30-1.45) 1.48, up to tip of frontal projection (1.14-1.22), width (0.78-0.83)0.99; postmentum length (0.78-0.80), widest width (0.23), narrowest

width (0.13); pronotum length (0.20-0.23), width (0.52-0.57)0.65. (Holmgren, 1913)... ... ...**T. brevicornis** Haviland

Frontal projection seen laterally elongated, pointed, upturned 2

2. *Seen laterally the lower margin of the frontal projection straight; larger species; head length with mandibles 3.42*; head yellow; antennae with 14 articles, the second slightly shorter than the third, the latter one-and-a-half times as long as the fourth; postmentum narrowest in the middle; head length to side base of mandibles 2.28, up to frontal projection (1.69); postmentum length (0.91), widest width (0.26), narrowest width (0.13); pronotum length (0.13), width 0.65. (Holmgren, 1913)... ...**T. laticornis** Haviland

Seen laterally the lower margin of the frontal projection curved; smaller species; head length with mandibles up to 3.08... 3

3. Head length with mandibles 2.80-3.08 4

Head length with mandibles appreciably less than 2.80... 6

4. *Head length with mandibles 3.08*; frontal projection pointed, upturned antennae with 14 articles, the second slightly longer than the third, the fourth almost as long as the third; anterior margin of labrum slightly convex, antero-lateral angles greatly produced, sides parallel; head length to tip of frontal projection (1.63)1.67-(1.68), width (0.83-0.93)0.95; postmentum length (0.57), width (0.26), narrowest width (0.18); pronotum length (0.28-0.31), width (0.49)-0.61(0.62). (Holmgren, 1913)... ... ...**T. comis** Haviland

Head length with mandibles up to 2.87 5

5. *Anterior margin of labrum indented*, v-shaped; head light castaneous brown; eye spots hyaline; antennae with 14 articles, the third slightly longer than the second and fourth; labrum narrow, parallel-sided; pronotum with a slight median notch anteriorly, emarginate posteriorly; head length with mandibles 2.80, up to tip of frontal projection 1.60-1.80, width 1.10; length of the left mandible 1.60, pronotum length 0.30, width 0.60. (Snyder, 1934) ... ... **T. marjoriae** (Snyder)

Anterior margin of labrum not indented, slight convex; antennal ridge produced into a prominent, sharply pointed spine; second antennal article slightly longer than the third, the fourth shortest; postmentum not twice as broad anteriorly as posteriorly; head length with mandibles 2.87, up to tip of frontal projection (1.35-1.43),

with mandibles 1.48-1.52, width (0.75)-0.84; postmentum length (0.63,) widest width (0.28), narrowest width (0.18); pronotum length (0.26), width (0.52)-0.53. (Holmgren, 1913)... ... ... **T. rostratus** Haviland

6. Ratio of the length of the head capsule to its width 1.50-1.53... ...7
Ratio of the length of the head capsule to its width 1.75; head cylindrical, light yellow, with a distinct depression at the base of the frontal projection; third antennal article slightly shorter than the second; the fourth shortest; head length with mandibles 2.28, without mandibles 1.33, width 0.76; pronotum width 0.49. (Holmgren, 1914)... ... ... **T. propinquus** (Holmgren)

7. *Head length up to frontal projection 1.37*; second and third antennal articles subequal; head width 0.91; pronotum width 0.53. (Holmgren, K. & N., 1917)... ... ...**T. flletcheri** (Holmgren, K. & N.)

Head length up to frontal projection 1.63; head yellow, rectangular; labrum bilobed, sides round; antennae with 14 articles, the second as long as the third, the fourth slightly shorter; head length with mandibles 2.47, width 1.06; pronotum width 0.57. (Holmgren, 1914)*... ... ...**T. lighti** Snyder & Emerson

Genus *ANGULITERMES* Sjostedt

Imago

Angulitermes dehraensis (Gardner): Head dark brown, with dense short hairs and scattered long bristles, fontanelle like a narrow longitudinal slit; eyes nearly round; ocelli round, separated from the eyes by their diameter; postclypeus twice as wide as long; antennae with 15 articles, the second much longer than the third or fourth; pronotum of the same colour as the head, without emargination both anteriorly and posteriorly; head length to tip of labrum 0.83-0.88, without mandibles 0.70-0.75, width 0.80-0.90(0.93-0.95); diameter of eye (0.19-0.20), distance from the lower margin of the head (0.078-0.091); ocellus length (0.091-0.109), width (0.078-0.091), distance from the eye (0.078-0.104); pronotum length (0.44-0.46), width 0.70(0.75)-0.80(0.85). (Gardner, 1944)

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*Described by Holmgren (1914) under the name of *"Mirotermes (Mirotermes) ceylonicus."*

Soldiers

1. Head distinctly wider anteriorly... 2

   Head uniformly wide, frontal projection in lateral view rectangularly truncated; head length to tip of frontal projection 1.21, width 0.91; pronotum width 0.53. (Holmgren, K. & N., 1917)... ... ... **A. obtusus** (Holmgren, K. & N.)

2. *Frontal projection with broadly curved tip and with a small notch in the lower half; projection at the side of the head near the base of the mandible very prominent*; head brownish yellow, sparsely hairy, subquadrate, sides somewhat sinuate, widest a little anterior to the middle; frontal projection with a few curved hairs on the anterior margin, the margin above the notch slightly convex, below the notch rounded; projection at the side of the head near the base of the mandibles broadly curved; antennae with 14 articles, the second slightly shorter than the third, the fourth shortest; labrum concave anteriorly, widest in the anterior half; pronotum strongly saddle-shaped, anterior lobe considerably raised; head length with mandibles (2.54), without mandibles 1.12(1.19-1.25), width 0.89(0.92-0.94)1.06; length of mandible 1.34-1.45; postmentum length (0.42-0.46), width (0.25-0.33); pronotum length (0.18-0.21), width (0.46-0.50). (Gardner, 1944)... ... ...**A. dehraensis** (Gardner)

   Frontal projection narrowly rounded at the tip, with a depression in the middle; projection at the side of the head near the base of the mandibles distinct but not prominent; head yellowish brown, sparsely hairy, subquadrate, widest in the anterior half, sides depressed a little below the middle; the margin of the frontal projection seen laterally both above and below the depression straight; antennae with 14 articles, the second shorter than the third, the fourth shortest; labrum concave anteriorly, widest anteriorly; anterior lobe of pronotum considerably raised, not indented; head length with mandibles 1.92-2.00, without mandibles 0.87-1.00, width 0.81; postmentum length 0.44, width 0.25-0.27; pronotum length 0.29, width 0.46. (Ahmad, 1955a) ... ...**A. hussaini** Ahmad

Genus *MIROCAPRITERMES* Holmgren

Single species: **Mirocapritermes connectens** Holmgren

SOLDIER: Head light yellow, with rather thick growth of short hairs, cylindrical, frons sloping; frontal projection seen above triangular;

labrum rectangular, with long antero-lateral processes; mandibles asymmetrical; antennae with 14 articles, the second as long as the third and fourth combined; head length with mandibles 2.01, without mandibles 1.03, width 0.68; pronotum width 0.41. (Holmgren, 1914).

Genus *HOMALLOTERMES* John

KEY TO THE SPECIES

Imagoes

Body length without wings 3.80; head brown, broadly oval, covered with fine dense hairs; ocelli very close to the eyes, the second antennal article longer than the third, the latter shortest; postclypeus much shorter than half its width; pronotum straight anteriorly, emarginate posteriorly; head width 0.84, pronotum length 0.38, width 0.61. (Holmgren, 1914) ... ...**H. penangi** Holmgren,

Body length without wings 5.00; head ovate; ocelli close to the eyes; fontanelle narrow; antennae with 15 articles, the third very short; pronotum emarginate posteriorly; wings hairy, length 6.50. (Holmgren, 1913).. ... ... **H. foraminifer** (Haviland)

Soldiers

Head length with mandibles 2.43(2.54); third antennal article indistinctly longer than the second; pronotum not indented anteriorly; head length without mandibles 1.13-(1.27), width 0.84-(0.91); pronotum width 0.45. (Holmgren, 1914) ... ...**H. penangi** (Holmgren)

Head length with mandibles 2.89; third antennal article one-and-a-half times as long as the second; head distinctly narrowed anteriorly; mandibles slightly bent; pronotum indistinctly notched anteriorly, slightly depressed posteriorly; the third and fourth antennal articles subequal: head length without mandibles 1.37-(1.48); width 0.99 (1.04); length of the left mandible (1.35); postmentum length (0.55), widest width (0.26), narrowest width (0 20); pronotum width 0 53(0.57). (Holmgren, 1913)... ...**H. foraminifer** (Haviland)

Genus *CAPRITERMES* Wasmann

KEY TO THE SPECIES

Imagoes

1. Ocelli very close to the eyes, separated by distinctly less than their short diameter... 2
   Ocelli further from the eyes... 3
2. *Ocelli almost touching the eyes; pronotum distinctly emarginate posteriorly*; head dark brown behind, lighter anteriorly; fontanelle large, ocellus-

like; eyes round; antennae with 15 articles, the second, third and fourth almost subequal; postclypeus shorter than half its width; pronotum trapezoid; head length up to tip of labrum 1.23 (1.27)-1.34, without mandibles (0.83-0.88), width 1.09-1.13(1.17-1.19); diameter of eye (0.33-0.36), distance from the lower margin of the head (0.078-0.085); ocellus length (0.18-0.20), width (0.13), distance from the eye (0.039-0.046); fontanelle length (0.117), width (0.072); pronotum length (0.54)0.56, width (0.86-0.90)0.91. (Kemner, 1934) ... ...**C. buitenzorgi** Holmgren

Ocelli farther from the eyes; pronotum indistinctly emarginate posteriorly; head castaneous, ovate, fontanelle visible; antennae with 15 articles, the third slightly longer than the second; body length 7.00. (Holmgren, 1913)... ... ... **C. speciosus** (Haviland)

3. Postclypeus nearly half as long as wide... 4

Postclypeus distinctly shorter than half its width... 8

4. *Head length to tip of labrum 0.86:* head castaneous, thickly hairy, not narrowed anteriorly; antennae with 15 articles, the third slightly longer than the second; pronotum straight anteriorly, antero-lateral angles broadly rounded, posterior margin not emarginate; meso- and metanota deeply indented; head width 0.84; long diameter of eye 0.28. (Silvestri, 1922)... ... ...**C. distortus** Silvestri

Head length to tip of labrum 1.03-1.53 5

5. *Pronotum distinctly notched anteriorly, anterior margin convex*; antennae with 15 articles, the third shorter than the fourth; postclypeus light brown, lighter than the head; head length to tip of labrum 1.03, width 0.95; pronotum length 0.46, width 0.72. (Holmgren, 1913) ... ... **C. distinctus** Holmgren

Pronotum indistinctly notched anteriorly, anterior margin straight or concave 6

6. *Head length with labrum 1.33-1.53, width 1.22(1.27)-1.29*; antennae with 14-(15) articles, in specimens with 15 articles the second twice as long as the third, the latter as long as fourth; ocelli large, broadly oval; eyes almost round; postclypeus almost twice as long as wide, brown, lighter in colour than the head; pronotum slightly emarginate posteriorly, not emarginate anteriorly; head length without mandibles (0.93); long diameter of eye (0.28), short diameter (0.26), distance from the lower margin of the head (0.104); ocellus length (0.15),

width (0.13), distance from the eye (0.13); pronotum length 0.57-(0.65), width 0.95-1.06. (Holmgren, 1913)... ... ...**C. incola** (Wasmann)

Head length with labrum 1.09-1.18, width 1.10-1.18 7

7. *Postclypeus with anterior margin concave, half as long as wide, concolorous with the head, rufus*; head rufus, densely hairy; fontanelle distinct, oval; ocelli separated from the eyes by nearly their short diameter; antennae with 14 articles; pronotum straight anteriorly, anterolateral corners pointed; meso- and metanota indented; head length to tip of labrum 1.09, width 1.10; long diameter of eye 0.28. (Silvestri, 1923) ... ... **C. obtusus** Silvestri

Postclypeus with anterior margin straight, slightly less than twice as long as wide, lighter in colour than the head, light yellow; head dark brown, oval, narrowed anteriorly; fontanelle oval, large; ocelli separated from the eyes by about half their diameter; antennae with 15 articles, the second, third and fourth almost subequal; head length to tip of labrum 1.14-1.18, width 1.14-1.18; pronotum length 0.57, width 0.95-1.03; forewings 8.00. (Holmgren, 1913) ... ... **C. ceylonicus** Holmgren

8. *Ocelli more than twice as long as wide*; head dark brown, fontanelle elevated, placed behind the centre of the head; ocelli separated from the eyes by nearly their long diameter; antennae with 14 articles, the second longer than the fourth, the third shortest; postclypeus much shorter than half its width; pronotum straight anteriorly, shallowly emarginate posteriorly; head length to tip of labrum 1.35, width 1.15; fontanelle length 0.09, width 0.06; ocellus length 0.013, width 0.005; postclypeus length 0.17, width 0.54; pronotum length 0.62, width 0.95. (Light, 1929). ... ...**C. fuscotibialis** Light

Ocelli distinctly less than twice as long as wide... 9

9. *Head width 1.28*; head black; fontanelle small but distinct; ocelli separated from the eyes by their long diameter; antennae with 15 articles, the third much shorter than the second; postclypeus black; pronotum very dark brown, widest in the middle, sides uniformly curved, halfmoon-shaped; posterior margin almost straight; pronotum width 1.10; length of forewings 12.50. (Gardner, 1944) .. .. **C. garthwaitei** Gardner

Head width up to 1.18... 9

10. Fontanelle dot-like 10
Fontanelle large, broadly oval 11

11. *Pronotum deeply emarginate posteriorly; eyes smaller*; head brown, densely hairy, round; eyes almost round, slightly bulging; ocelli large, oval, posterior end somewhat pointed; antennae with 15 articles, the second nearly twice as long as the third, the fourth and third subequal; pronotum subcordate, with a somewhat T-shaped median marking, and an ocellus-like marking on each lateral corner and a similar marking a little above the emargination of the posterior margin; head length to tip of labrum (0.91-1.09), without mandibles (0.70-0.77), width (0.90-0.95)1.03; long diameter of eye (0.19-0.21), short diameter (0.18-0.19), distance from the lower margin of the head (0.09), ocellus length (0.09-0.12), width (0.07-0.09), distance from the eye (0.07-0.09); pronotum length (0.50)-0.53(0.54), width 0.80(0.81-0.86). (Holmgren, K. & N., 1917) ... ... **C. punjabensis** Holmgren, K. & N.

Pronotum almost straight posteriorly; eyes larger; head dark brown, broadly oval; eyes round; antennae with 14 articles, the third one-and-a-half times as long as the second; head length to tip of labrum 1.10-(1.19), without mandibles (0.75 0.80), width 0.99(1.01-1.06); diameter of eye (0.26-0.31), distance from the lower margin of the head (0.05); ocellus length (0.11-0.12), width (0.09-0.10), distance from the eye (0.052 0.059); pronotum length 0.46(0.49-0.52), width 0.80(0.83-0.88). (Holmgren, 1913)... ... ...**C. nemorosus** (Haviland)

12. Pronotum distinctly emarginate posteriorly; head width 1.13-1.16.....14
Pronotum indistinctly emarginate posteriorly; head width 0.82-0.93..13

13. *Fontanelle located below the level of the posterior margin of the eyes; antero-lateral corners of the pronotum prominent; meso- and metanota shallowly notched*; fontanelle with two diverging lines from its tip; eyes round; antennae with 14-15 articles, in specimens with 14 articles the second and third subequal, in specimens with 15 articles the second as long as the third and fourth combined; head length to tip of labrum (0.94)-1.03, without mandibles (0.67), width 0.91-(0.93), diameter of eye (0.26), distance from the lower margin of the head (0.065); ocellus length (0.13), width (0.078); distance from the eye (0.067); pronotum length 0.42-(0.46), width 0.68(0.81). (Holmgren, 1913)... ... ...**C. semarangi** Holmgren

Fontanelle located above the level of the posterior margin of the eyes;

antero-lateral corners of pronotum not prominent; meso- and metanota deeply notched; ocelli separated from the eyes by their short diameter; antennae with 14 articles, the third slightly shorter than the second; head length to tip of labrum 0.91, width 0.82; long diameter of eyes 0.32. (Silvestri, 1922)... ...**C. santschii** Silvestri

14. *Posterior margin of postclypeus weakly convex; fontanelle extending beyond the posterior level of the eyes; head almost parallel-sided beyond the antennae;* ocelli separated from the eyes by their short diameter head length 1.41-1.45, width 1.13-1.16; pronotum length 0.56, width 0.88-0.92; length of forewing with scale 11.00. (Kemner, 1934) ... ... **C. mohri** Kemner

Posterior margin of postclypeus strongly convex; fontanelle not extending beyond the posterior level of the eyes; head narrowed beyond the antennae, dark brown; antennae with 14-15 articles, in specimens with 15 articles the second one-and-a-half times as long as the third; head length to tip of labrum (1.30), without mandibles (0.80), width (1.13); diameter of eye (0.28), distance from the lower margin of the head (0.065), ocellus length (0.15), width (0.083), distance from the eye (0.065); pronotum length 0.40-0.50(0.54), width 0.87 (0.93)-1.00. (Hozawa, 1915)... ...**C. nitobei** Oshima

Soldiers

1. Anterior margin of labrum almost straight or only slightly concave or sinuate, antero-lateral corners short... 2

Anterior margin of labrum deeply cut, antero-lateral corners produced into long processes ... ...

2. Head length with mandibles 4.42-6.04, width 1.48-1.95 3

Head length with mandibles 2.72-3.94, width 0.87-1.35 5

3. *Head length with mandibles 6.04;* head reddish brown, sparsely hairy; fontanelle dot-like; antero-lateral angles of the head above the side base of the mandibles not produced into tubercles; antennae with 15 articles, the second and fourth subequal, the third slightly shorter; labrum short, anterior margin straight; pronotum somewhat notched anteriorly; head length without mandibles 3.23-(3.28), width (1.95-1.98); length of the left mandible (2.65); postmentum length (1.87), width (0.26); pronotum length (0.46), width (1.30)-1.33. (Holmgren, 1913)... ... ...**C. speciosus** (Hav.)

Head length with mandibles 4.42-4.90 4

4. *Antero-lateral angles of labrum very short, anteriorly directed; labrum much wider than long, posterior margin slightly narrower than anterior margin;* head yellow, with a few scattered bristles; median suture distinct, extending up to the hind margin of the head; antennae with 14 articles, the third longer than the second; head length with mandibles 4.42-4.90, without mandibles 2.54-2.83, width 1.48-1.55; pronotum width 0.77-0.92. Holmgren, 1914)... ... ...**C. latignathus** Holmgren

Antero-lateral angles of labrum rather distinct, laterally produced, in level with the anterior margin of labrum, the left process longer than the right process; labrum only slightly longer than wide, posterior margin half as wide as anterior margin; median suture of the head prominent, extending up to the hind margin; antennae with 14 articles; head length with mandibles 4.42, without mandibles 2.60, width 1.50. (Silvestri, 1922)... ... ...**C. tetraphilus** Silvestri

5. Head length with mandibles 2.72-2.86 6

Head length with mandibles 3.25-3.94... 7

6. *Labrum with posterior margin shallowly concave, postero-lateral corners broadly rounded, not prominent, widely separated; head sparsely hairy; left mandible with a small point at the tip; median suture of the head distinct,* extending up to the hind margin; antennae with 14 articles, the second as long as the third, the fourth shortest; tubercle above the side base of the mandibles not distinct; pronotum slightly emarginate anteriorly; head length with mandibles 2.72-2.86, without mandibles 1.60(1.76)-1.77, width 0.87-0.92(0.93); length of the left mandible (1.04); postmentum length (1.14), width (0.18); pronotum length (0.31), width (0 59)0.60-0.63. (Kemner, 1934) ... ... **C. semarangi** Holmgren

Labrum with posterior margin narrow v-shaped, postero-lateral corners sharply pointed, prominent, approximated; head with a dense coat of short hairs; left mandible without point at the tip; median suture of the head indistinct; head length with mandibles 2.80, without mandibles 1.65, width 0.93; length of the left mandible 1.15. (Silvestri, 1922) ... ...**C. distortus** Silvestri

7. Median suture either absent or only faintly indicated, if indicated not extending up to the fontanelle... 8

Median suture of the head deep, strongly marked, extending up to the fontanelle 10

8. *Head almost twice as long as wide*; fontanelle dot-like; antennae with 13-(14) articles, the second and third almost subequal, the fourth slightly shorter; left mandible not pointed apically; head length with mandibles 3.50, without mandibles 2.09-(2.18), width 1.06; length of the left mandible (1.24); pronotum length (0.30), width (0.72)-0.80. (Holmgren, 1913) ...**C. ceylonicus** Holmgren

Head wider... 9

9. *Median suture visible in the posterior half of the head*; third antennal article longer than the second; head length with mandibles 3.80, without mandibles 2.28, width 1.25; pronotum width 0.91. (Holmgren, 1913)... ... ... **C. distinctus** Holmgren

Median suture of the head not at all visible; antennae with 14 articles; labrum longer than wide, anterior margin straight; head length 3.72, without mandibles 2.10, width 1.21. (Silvestri, 1922) ... ... **C. modgliani** Silvestri

10. Antero-lateral corners of labrum distinct, produced into short narrow processes 11

Antero-lateral corners of labrum indistinct, not produced into narrow processes, very short; head with a few scattered bristles; antennae with 14 articles, the third nearly one-and-a-half times as long as the fourth; anterior margin of labrum faintly convex; left mandible with a point at the tip; head length with mandibles 3.36-3.65, without mandibles 1.84-2.08(2.18), width 1.16(1.21)-1.23; length of the left mandible (1.45); postmentum length (1.09), width (0.16); pronotum length (0.36), width 0.74-0.77(0 78). (Kemner, 1934)... ... ... **C. mohri** Kemner

11. *Anterior margin of labrum straight*; antennae with 14 articles, the third one-and-a-half times as long as the fourth and as long as the second; left mandible with a point at the tip; pronotum slightly indented anteriorly; head length with mandibles 3.55-3.94, without mandibles 2.12-2.30 (2.39), width 1.27-1.31(1.35); length of the left mandible 1.61; pronotum width 0.77-0.85. (Kemner, 1934) ... ...C.**buitenzorgi** Holmgren

Anterior margin of labrum shallowly concave; head yellow to brownish yellow, with scattered bristles; median suture depressed, either dark brown or colourless; fontanelle dot-like; antennae with 14 articles, the second as long as the third, the fourth shortest; labrum nearly as long as wide, sides rounded; left mandibles with the tip obliquely truncated, without point; pronotum slightly indented anteriorly, shallowly emarginate posteriorly; head length with mandibles 3.25-3.70, without mandibles 2.00-2.35, width 1.00-1.17; length of the right mandible 1.20; pronotum length 0.30-0.33, width 0.63-0.77. (Hozawa, 1915)... ... ...**C. nitobei** (Shiraki)

12. *Head length with mandibles 2.51*; antennae with 14 articles; pronotum not incised anteriorly; head length without mandibles 1.48, width 0.95; pronotum width 0.65. (Holmgren, K. & N., 1917)... ... ... **C. fletcheri** Holmgren, K. & N.

Head length with mandibles 3.12-5.82... 13

13. *Head length without mandibles 3.48;* antennae with 14 articles, the third and fourth subequal, the second shorter; pronotum deeply notched anteriorly, moderately emarginate posteriorly; head width 1.92; length of the left mandible 2.34; postmentum length 2.13, width 0.26; pronotum length 0.46, width 1.30 (All measurements by the author)... ... ...**C. greeni** John

Head length without mandibles up to 2.39... 14

14. Left mandible almost as long as the head capsule, difference between the head length and the length of the left mandible 0.00-0.05 ...15

Left mandible shorter than the head capsule, difference between the head length and the length of the left mandible 0.10-0.58 17

15. *Tip of the left mandible without point*, truncated, head sparsely hairy; median suture distinct, extending up to the hind margin of the head; head length without mandibles 2.00, width 1.30; length of the left mandible 2.00. (Silvestri, 1923)... ... ...C. **obtusus** Silvestri

Tip of the left mandible with a point... 16

16. *Tip of the left mandible bent inward like a beak*; head yellow with a few scattered bristles; median suture faintly indicated; antennae with 14 articles, the third somewhat longer than the second; pronotum very slightly indented anteriorly; head length with mandibles 4.14, without mandibles 2.09, width 1.48; pronotum width 0.91. (Holmgren, 1913)... ... ...**C. incola** Holmgren

Tip of the left mandible not bent inwards like a beak; head length without mandibles 2.10, width 1.30; length of the left mandible 2.10. (Silvestri, 1922) ... ... **C. gravelyi** Silvestri

17. *Head almost twice as long as wide*, cream coloured, with a few scattered bristles; median suture extending beyond the middle of the head; antennae with 14 articles, the second as long as the third, the fourth slightly shorter; left corner of the labrum distinctly longer than the right corner; head length with mandibles (3.12), without mandibles (1.87)-2.08, width (0.98)-1.04; length of the left mandible 1.50; postmentum length (1.04), width (0.10); pronotum length (0.31), width (0.62). (Silvestri, 1922) ... ... **C. santschii** Silvestri

Head less than twice as long as wide 18

18. *Inner margin of the tip of the left mandible with a minute tooth below the apical point; side base of the antero-lateral corners of the labrum produced into sharply pointed, rather long corners;* head light yellowish brown, sparsely hairy; median suture distinct, up to the hind margin of the head; pronotum distinctly indented anteriorly; head length with mandibles 3.32-3.39, without mandibles 1.87-1.91, width 1.02; pronotum width 0.63-0.65. (Kemner, 1930)... ... ... **C. padangensis** Kemner

Inner margin of the tip of the left mandible with a minute tooth below the special point; side base of the antero-lateral processes of the labrum not produced into pointed processes 19

19. *Median suture of the head absent; length of the left mandible 2.08;* head cream yellow; lateral sides of labrum strongly convex; pronotum with indistinct notch anteriorly; head length without mandibles 2.25, width 1.45. (Silvestri, 1914)... ... ...**C. laetus** Silvestri

Median suture of the head distinct; length of the left mandible 1.56-1.74... 20

20. *Frontal area greatly projected anteriorly; head width 1.46; pronotum distinctly notched anteriorly;* median suture distinct in the basal third of the head; head dark castaneous brown; head length with mandibles 3.75-3.97, without mandibles 2.01-2.24. (Gardner, 1944) ... ...**C. garthwaitei** Gardner

Frontal area not projected anteriorly; head width 1.03-(1.09); pronotum not notched anteriorly; antero-lateral corners of the head just above the side base of the mandibles produced into tubercles; antennae with 14 articles, the second slightly shorter than the third and slightly longer than the fourth; head length with mandibles 3.23-(3.38), without mandibles 1.75-(1.82); postmentum length (1.04-1.09), width (0.10-0.13), pronotum length (0.31-0.36), width (0.62)0.65-(0.72). (Holmgren, 1913)... ...**C. nemorosus** (Haviland)

Genus *PROCAPRITERMES* Holmgren

Imago

Procapritermes setiger (Haviland): Head castaneous brown, densely hairy, broadly oval; fontanelle small, located in the centre of the head; ocelli separated from the eyes by their diameter; postclypeus shorter than half its width; antennae with 14 articles, the third shorter than the fourth, the latter shorter than the second; pronotum straight anteriorly, slightly emarginate posteriorly. (Holmgren, 1913).

Soldiers

1. Head length without mandibles 2.62... 2
   Head length without mandibles 1.06-1.60... 3
2. *Head length with mandibles 5.59;* head yellow, with a few bristles; median suture distinct; labrum distinctly longer than wide, deeply cut anteriorly, antero-lateral angles long drawn out; pronotum not indented anteriorly; head length without mandibles 2.62, width 1.06 (Holmgren, 1913)... ... ...**P. atypus** Holmgren

   Head length with mandibles 4.62; head light yellow brown, with fairly numerous long hairs, rectangular; labrum twice as long as wide, asymmetrical, deeply concave anteriorly; with long drawn out antero-lateral angles; median suture of the head very distinctly marked; pronotum notched anteriorly; head length without mandibles 2.62, width 1.75; postmentum length 1.58, widest width 0.53, narrowest width 0.21; pronotum length 0.42, width 0.92. (major soldier). (Light, 1929)... ... ... **P. sowerbyi** Light
3. *Head length with mandibles 3.34, without mandibles 1.60-(1.69);* head yellow, thinly hairy; fontanelle distinct; antennae with 14 articles, the second as long as the third, the fourth somewhat shorter; pronotum slightly incised anteriorly; head width 0.80(0.88-0.93); length of the left mandible (1.69), postmentum length (0.78), width (0.23); pronotum length (0.33-0.36), width 0.57-(0.62). (Holmgren, 1913)... ... ... **P. setiger** (Haviland)

Head length with mandibles 2.36, without mandibles 1.06, width 0.68; pronotum width 0.38. (Holmgren, 1913)... ... ... **P. minutus** (Haviland)

Genus *PSEUDOCAPRITERMES* Kemner

KEY TO THE SPECIES

Imagoes

1. *Third antennal article distinctly shorter than the fourth; head brownish yellow*, densely hairy; fontanelle large, round; eyes small, bulging; ocelli separated from the eyes by their short diameter, seen from above inner margin strongly convex; postclypeus distinctly shorter than half its width; pronotum straight anteriorly, indistinctly emarginate posteriorly, antero-lateral corners not prominent; head length to tip of labrum 1.31, width 1.05; pronotum length 0.43, width 0.92. (Kemner, 1934)... ... ...**P. silvaticus** Kemner

Third antennal article as long as the fourth; head black, very densely hairy; fontanelle large, round; eyes small, bulging; ocelli separated from the eyes by their short diameter; antennae with 15 articles; postclypeus shorter than half its width; pronotum without emargination both anteriorly, and posteriorly; head width 0.84; pronotum length 0.38, width 0.61. (Holmgren, 1914)... ... ...**P. angustignathus** Holmgren

Soldiers

Third antennal article distinctly longer than the second; smaller species; median suture extending up to the fontanelle; head light brown, parallel-sided; sparsely hairy; antennae with 14 articles, the third slightly longer than the fourth; labrum almost as long as wide, deeply concave anteriorly, antero-lateral angles produced into spine-like processes; pronotum slightly indented anteriorly, slightly depressed in the middle posteriorly; head length with mandibles 3.90-4.30, without mandibles 1.94-2.15, width 1.20-1.34; pronotum width 0.67-0.74. (Kemner, 1934)... ... ...**P. silvaticus** Kemner

Third antennal article as long as the second; larger species; median suture visible in the posterior half of the head; head without hairs, rectangular; fontanelle distinct; antennae with 14 articles, the third slightly shorter than the fourth; pronotum indented anteriorly; head length with mandibles 4.67, without mandibles 2.39, width 1.44; pronotum width 0.95. (Holmgren, 1914)... ... ...**P. angustignathus** Holmgren

APPENDIX

List of termites not included in the key

Kalotermitidae

Glyptotermes brevicaudatus (Haviland), soldier.
buttel-reepeni (Holmgren), soldier.
dentatus (Haviland), imago.
pinangae (Haviland), imago.

Kalotermes inamurae Oshima, imago and soldier.

Neotermes lagunensis (Oshima), soldier.
medius Oshima, imago.

Rhinotermitidae

Coptotermes oshimae Light & Davis, soldier.

Parrhinotermes inaequalis (Haviland), imago.
pygmaeus John, soldier.

Reticulitermes flaviceps (Oshima), imago.

Schedorhinotermes brevialtus (Haviland), minor soldier.
holmgreni Emerson, major soldier.
tarakanensis (Oshima), major soldier.

Termitidae

Bulbitermes perpusillus (John), soldier.
Eurytermes ceylonicus Holmgren, soldier.

Hirtitermes sinabangensis Oshima, soldier.
spinocephalus (Oshima), soldier.

Hospitalitermes bicolor (Haviland), imago.
blairi Roonwal & Sen-Sarma, soldier.
ferrugineus (John), soldier.
grassii Ghidini, soldier.
nemorosus Ghidini, soldier.

Hypotermes nongpriangi Roonwal & Sen-Sarma, soldier.

Lacessititermes batavus Kemner, imago.
breviarticulatus (Holmgren), imago.
cuphus (Silvestri), soldier,
lacessitus (Haviland), imago.

Macrotermes singaporensis (Oshima), imago and soldier.
Microcerotermes havilandi Holmgren, imago.
madurae Kemner, soldier.

Microtermes tenuis Oshima, imago.

Nasutitermes alticola (Holmgren), imago and soldier.

corporaali (Wasmann), soldier.
havilandi (Desneux), imago.
horni (Wasmann), soldier.
jacobsoni Oshima, soldier.
meridianus Light & Wilson, imago.
oculatus (Holmgren), imago.
sandakanensis (Oshima), soldier.

Odontotermes celebensis Oshima, soldier.

dives (Hagen), soldier.
flavomaculatus Holmgren, K. & N., soldier.
karawajevi John, soldier.
malabaricus Holmgren, K. & N., imago.
sarawakensis Holmgren, imago.
simalurensis Oshima, soldier.
sinabangensis Kemner, soldier.

Subulitermes kotuae (Bugnion), imago and soldier.

Synhamitermes ceylonicus (Holmgren), imago.

Termes laticornis Haviland, imago.

Trinervitermes longinotus (Snyder), imago.

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Biology and Control of the Hairy Caterpillar (*Euproctis abjecta* Swinhoe) in Karachi

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and

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INTRODUCTION

Little work seems to have been done in the past on the life history and methods of control of *Euproctis abjecta*. Swinhoe (1884) was the first to record and describe the species from the former Province of Sind (Hyderabad Division).

The genus *Euproctis* is widely distributed in Indo-Pakistan sub-continent and almost all its species are of considerable economic importance. In November, 1954, the authors collected *Euproctis abjecta* in the Secretariat compound at Karachi on *Acacia arabica*. The tree was heavily infested with all the stages of this insect. An extensive survey of gardens, parks and residential buildings was immediately undertaken and it was found that the insect occurred also on *Prosopis juliflora*, *Ricinus communis*, *Terminalia catalapa*, and some wild bushes throughout Karachi and the adjoining areas. The larvae of the moth as a result of mere contact cause severe itching, irritation and even blisters on human skin. The hairs of the larval body and the female tuft are poisonous and have been responsible for many deaths in the past when the larvae got entry into human and cattle food.

An attempt has been made to study, in some detail, the biology of the moth so as to find out its biotic potential and determine other points in its life cycle which can be utilized towards an effective control. With this end in view, a few insecticidal trials were also undertaken in the laboratory.

IDENTIFICATION

Swinhoe (1884) described this species on the basis of morphological characters of the adult moth and named it as *Somena abjecta*, a synonym of *Euproctis abjecta*. According to his description the characters of the species are "Male and Female of a pale dirty yellowish-buff colour; top of head whitish; abdomen brown; anal tuft ochraceous; forewings suffused with pale reddish brown and covered with black atoms; an antemedial and a post medial, very indistinct pale transverse thin bands which curve outwardly and are only apparant on some specimens. Underside pale greyish white tinged with fresh colour unmarked".

HABIT AND HABITAT

The larva of the moth is a voracious feeder. On emergence from egg, it feeds on inflorescence, if present at that time; otherwise on tender buds or foliage. When noticed from a close quarter, it has been found that the caterpillar eats a small portion of leaves or blossom and moves on to another place to repeat the same process thus causing extensive damage.

Euproctis is a widely distributed genus having its range over the Palaearctic, African, Oriental and Australian regions. Janjua (1947) reported that the genus is represented by 52 species. Among the important Indo-Pakistan species mentioned by him are *Euproctis lunata*, Wlk. on *Acacia arabica* and ber (*Ziziphus jujuba*); *Euproctis scientillans* Wlk. on linseed, lady's finger, sorghum and mango; *Euproctis icilia* Stoll on *Loranthus*; *Euproctis flava* Fab. on fruit trees of all kind; *Euproctis fraterna* Moor. on apple, quinces, apricot, pomegranate, peach, plum, pear, rose, castor, pulses, mulberry and brinjal; *Euproctis signata* Blan. on *Aesculus indica*, *Acer* sp., *Juglans regia*, *Parrotia jacquemontiana*, *Pyrus* sp., ber, peaches, apple, plum and apricot.

LIFE AND SEASONAL HISTORY

Soon after the emergence of moth, copulation takes place and lasts between thirty minutes to nine and a half hours (Table III). It has been observed that in majority of cases the pair mated more than once and copulation took place invariably during first half of the day and continued up to noon or later. The premating period varied from 2 hours to 48 hours, majority of the cases lying within the limit of 2 to 4 hours (Table I).

Figure I Showing egg cluster

Figure II
Showing 1st stage larva.

Figure III
Showing 2nd stage larva

Figure IV Showing 3rd stage larva

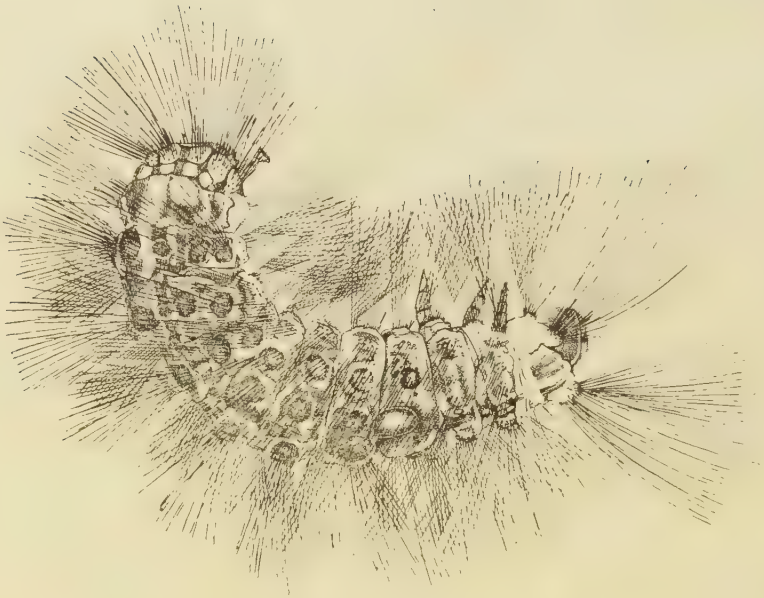

Figure V Showing 4th stage larva

TABLE I. PREMATING PERIOD

Date/time of emergence of Male/Female:	Date/time of mating of pair:	Premating time in hours.
17.2.55/9 A.M.	19.2.55/9 A.M.	48.0
20.2.55/9 A.M.	21.2.55/12.15 P.M.	27.75
2.3.55/6 P.M.	3.3.55/9 A.M.	15.0
5.3.55/7 A.M.	5.3.55/9 A.M.	2.0
5.3.55/7 AM.	5.3.55/9 A.M.	2.0
23.3.55/7 A.M.	23.3.55/9 A.M.	2.0
26.3.55/5.15 A.M.	26.3.55/9 A.M.	3.25
3.4.55/4.5 P.M.	4.4.55/5.5 AM	13.0
3.4.55/5 P.M.	4.4.55/5 A.M.	12.0
16.4.55/7 A.M.	16.4.55/9 A.M.	2.0
7.5.55/6 A.M.	7.5.55/8 A.M	2.0

A single female can lay 15-200 eggs during the course of 1-3 days. The preoviposition period varied from 3.35 to 53.45 hours with an average of 21.3 hours. (Table III). The eggs are round and creamy in colour measuring about 0.83 mm. and are laid in patches on inflorescence, young leaves and sometimes, in severe cases of infestation, on bark of the host plant also. The egg cluster is covered with yellowish silken hairs from the tip of the female abdomen (fig. 1). Just before hatching the eggs turn brownish yellow. The incubation period varies from four to eight days depending upon the prevailing season (Table II). The larvae pass through five moults before pupation and the total larval period varies from 12 days in mild summer to 42 days in winter; average around the year being 17.4 days (Table II).

After hatching, the Ist stage caterpillar, which measures about 3.22 mm. in length (fig. 2), feeds on tender leaves or inflorescence. The 2nd, 3rd, 4th and 5th instar larvae measure respectively about 4.68, 7.5, 11.8, and 16.9 mm. (figs. 3, 4, 5, & 6). After fifth and final moult, the insect undergoes pupation which varies from 5 days in August to 27 days in December, with yearly average of 14 days (Table II). At the end of this period the moth emerges (figs. 7 and 8). The life of a moth ranges from 26 hours to 124 hours (Table III) while the duration of total life period varies from 24 to 66 days (Table II).

The pest remains active throughout the year except during May and June when the temperature rises and the insect population declines. Fresh egg laying begins by July and continues up to April. The moth has several overlapping generations which vary between 5 and 10, according to the prevailing season in a year.

PARASITES

During the study of life and seasonal history of the moth, the authors came across parasitized eggs, larvae and pupae which were isolated and kept in specimen tubes and glass chimneys for the emergence of parasites. The species of parasites thus emerging have been recorded on each stage of the host.

From the previous literature it seems that only *Telenomus euproctidis* Wile has been recorded as an egg parasite on *Euproctis pseudoconspersa* Stand. from Japan (Thompson 1945). The authors have also recorded *Telenomus* sp. (fig. 9) as the egg parasite on *Euproctis abjecta*. In nature we came across large number of such parasitized eggs towards the end of April. Thompson (1945) mentioned among the list of recorded parasites, the names of *Apanteles conspersae* Fiske, *Apanteles* sp., *Apanteles lacteicolor* Vier., on *Euproctis flava*, *Euproctis fraterna*, *Euproctis lunata* and *Euproctis pseudoconsperse* from Japan, India and Formosa respectively. In the present study, however, *Apanteles* sp. (fig X) has also been found parasitizing larval stages of *Euproctis abjecta* during the month of May. The authors have also recorded, probably for the first time, a pupal parasite, *Brachymeria* sp. (fig. XI) near *obscurata* Wlk. (*Hym.-Chalcididae*) on *Euproctis abjecta*.

CONTROL

Weis (1931) studied two contact poisons, one a preparation of derris against *Euproctis chrysorrhoea* which according to him "proved of little value, as the body hairs allow only a small proportion of the dust to reach the skin". Pruthi & Isaac (1949) tried opium and opium marc (waste product left after extraction of opium) as stomach poison against *Euproctis lunata* Wlk. without any success. Grinson et al (1951) used 2% BHC against 2nd and 3rd instars larvae of *Euproctis chrysorrhoea*, but it proved quite ineffective. Boocock (1954) sprayed with a fog generator, 10% D. D. T. in oil against "exposed" larvae of *Euproctis* sp. and obtained 80-90% mortality in three days.

The authors also undertook some preliminary trials against *Euproctis abjecta* to find out suitable insecticides for its control. Accordingly BHC, Malathion, Folidol and Endrin were screened and it was found that 8 oz. of BHC 12%, 5 c.c. of Malathion 50%, 4 c.c. of Folidol 46.6% and 8 c.c. of Endrin 19% in 10 gallons of water, proved effective against all larval stages both under laboratory and field conditions. These insecticides were sprayed with John Bean Sparton Power Sprayer on

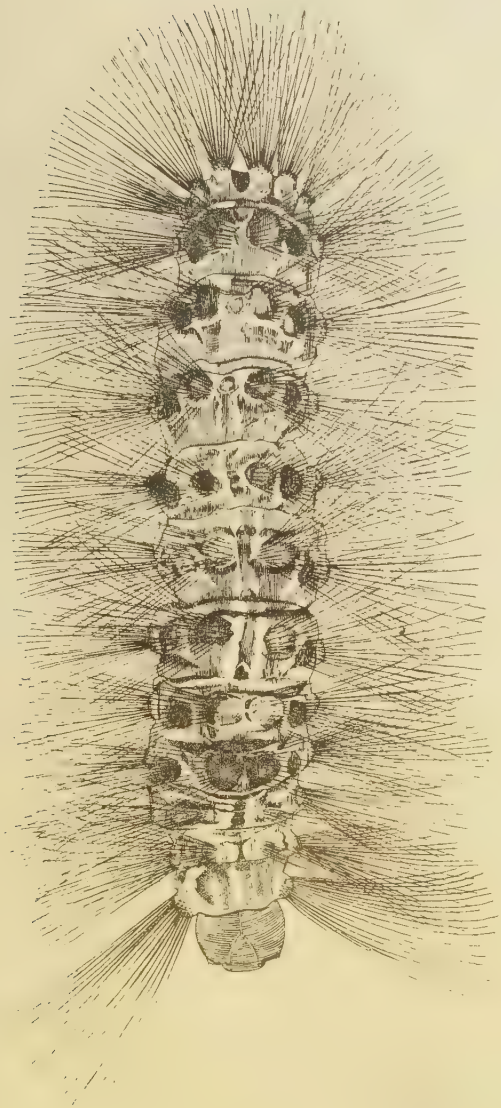

Figure VI Showing 5th stage larva

Acacia tree heavily infested with *Euproctis abjecta*. After an hour of the spray caterpillars began to drop down on the ground and the entire population perished within 24 to 72 hours.

ACKNOWLEDGEMENTS

The authors express thanks to Dr. Taskhir Ahmad, Director, for his valuable criticism in the preparation of the paper; to Mr Fateh Sher, Locust Assistant for carrying out most of field and laboratory observations, particularly those relating to control and rearing work; and to the Commonwealth Institute of Entomology, London, for the identification of species of the moth and its parasites.

SUMMARY

The pest remains active throughout the year and completes 5-10 generations. A single female can lay 15-200 eggs (average 62) in the course of 1-3 days. The incubation period varies from 4-8 days depending upon the prevailing season. The larvae pass through five moults before pupation and the larval period varies from 12 to 42 days during summer and winter months. Pupation takes place in a cocoon, yellowish in colour and the pupal stage lasts from 5 to 27 days during summer and winter months respectively. The duration of total life cycle varies from 24-66 days.

During the course of above study three Hymenopterous parasites were recorded, one parasitising the eggs, another the larvae and the third one the pupae.

A few modern insecticides like BHC 12%, Malathion 50%, Folidol 46.6% and Endrin 19%, when sprayed respectively at the rate of 8 oz., 5 c.c., 4 c.c. and 8 c.c., in 10 gallons of water, proved effective against larval stages of the moth and complete kill was obtained within 24-72 hours.

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TABLE II. SHOWING LIFE HISTORY OF EUPROCTIS ABJECTA SWINHOE (IN DAYS)

Date of egg laying	Date of hatching	Incubation period	Date of pupation	Larval period	Date of emergence of adult	Pupal period	Total life cycle
		(days)		(days)		(days)	(days)
30-11-54	4-12-54	4	15-1-55	42	4-2-55	20	66
13-12-54	21-12-54	8	19-1-55	29	4-2-55	16	53
20-12-54	27-12-54	7	18-1-55	22	7-2-55	20	49
18-1-55	26-1-55	8	21-2-55	27	4-3-55	12	47
31-1-55	8-2-55	8	13-3-55	24	12-3-55	9	41
31-1-55	8-2-55	8	3-3-55	24	16-3-55	13	48
31-1-55	8-2-55	8	1-3-55	20	14-3-55	13	44
19-2-55	24-2-55	5	17-3-55	23	24-3-55	7	35
19-2-55	24-2-55	5	14-3-55	20	24-3-55	10	35
26-2-55	2-3-55	5	21-3-55	19	3-4-55	13	37
3-3-55	9-3-55	6	22-3-55	13	2-4-55	11	30
4-3-55	8-3-55	4	23-3-55	15	4-4-55	12	31
4-3-55	8-3-55	4	23 3-35	15	4-4-55	12	51
5-3-55	10-3-55	5	23-3-55	13	4-4-55	12	30
5-3-55	10-3-55	5	23-3-55	13	4-4-55	12	30
10-3-55	16-3-55	6	29-3-55	13	4-4-55	6	25
10-3-55	16-3-55	6	29-3-55	13	6-4-55	8	27
25-3-55	29-3-55	4	14-4-55	16	26-4-55	12	32
16-4-55	21-4-55	5	5-5-55	14	19-5-55	14	33
15-7-55	20-7-55	5	8-8-55	18	13-8-55	5	28
11-8-55	17-8-55	6	29-8-55	12	10 8-55	19	37
11-8-55	16-8-55	5	31-8-55	15	10-8 55	21	41
11-8-55	16-8-55	5	29-8-55	13	10-9-55	6	24
11-8-55	16-8-55	5	29-8-55	13	10-9-55	13	31
9-10-55	14-10-55	5	26-10-55	12	2-11-55	7	24
9-10-55	14-10-55	5	28-10-55	14	5-11-55	8	27
21-10-55	27-10-55	6	11-11-55	15	23-11-55	12	33
21-10-55	27-10-55	6	11-11-55	15	22-11-55	11	32
21-10-55	27-10-55	6	11-11-55	15	22-11-55	11	32
21-10-55	27-10-55	6	11-11-55	15	22-11-55	11	32
21-10-55	27-10-55	6	9-11-55	13	19-11-55	10	29
21-10-55	27-10-55	6	9-11-55	13	20-11-55	11	30
26-10 55	1-11-55	6	18-11-55	17	29-11-55	11	34
26-10-55	1-11-55	6	17-11-55	16	29-11 55	12	34
26-10-55	1-11-55	6	15-11-55	14	29-11-55	14	34
27-11-55	4-12-55	7	21-12-55	17	17-1-56	27	51
27-11-55	4-12-55	7	22-12-55	18	17-1-56	26	51
27-11-55	4-12-55	7	22-12-55	18	14-1-56	23	48
27-11-55	4-12-55	7	22-12-55	18	14-1-56	22	41
27-11-55	4-12-55	7	23-12-55	19	17-1-56	25	51
27-11-55	4-12-55	7	21-12-55	17	12-1-56	22	46
27-11-55	4-12-55	7	21-12-55	17	12-1-56	22	46
27-11-55	4-12-55	7	21-12-55	17	14-1 56	24	48
Range :		4 to 8		12 to 42		5 to 27	24 to 66
Average :		5.79		17.4		14.09	39.8

TABLE III. SHOWING LIFE OF ADULT MOTH (*Euproctis abjecta* SWINHOE)

Date of emergence of month Male & Female	Date of mating	Time of copulation	Total mating period	Date and time of egg laying	Preoviposition period	Date & time on which		Total life of adult moth	
						Male died	Female died	Male	Female
17-2-55 at 9-00 A.M.	19-2-55	9-30 A.M. to 1-45 P.M.	4 Hrs. 15 M	19-2-55 2.00 P.M.	53 Hrs. 00 M	20-2-55 9-30 P.M.	22-2-55 9-00 A.M.	72.30 Hrs.	120.0 Hrs.
17-2-55 at 9-00 A.M.	19-2-55	9-00 A.M. to 1-45 P.M.	4 " 45 "	19-2-55 2.45 P.M.	53 „ 55 „	22-2-55 9-00 A.M.	22-2-55 9-00 A.M.	120.00 „	120.0 „
20-2-55 at 9-00 A.M.	21-2-55	8-55 P.M. to 12-10 P.M.	9 " 30 "	21-2-55 10.00 P.M.	37 „ 00 „	25-2-55 1-00 P.M.	24-2-55 8-00 A.M.	124.00 „	91.0 „
3-3-55 at 9-00 A.M.	3-3-55	9-00 A.M. to 3-30 P.M.	3 " 15 "	3-3-55 1-00 P.M.	16 „ 00 „	4-3-55 6-00 P.M.	5-3-55 11-00 A.M.	33.15 „	50.0 „
2-3-55 at 6-00 P.M.	3-3-55	9-00 A.M. to 3-30 P.M.	6 " 30 "	3-3-55 4-45 P.M.	22 „ 55 „	4-3-55 8-15 P.M.	4-3-55 8-15 P.M.	50.15 „	50.15 „
5-3-55 at 7-00 A.M.	5-3-55	9-00 A.M. to 1-25 P.M.	4 " 25 "	5-3-55 2-15 P.M.	7 „ 15 „	7-3-55 9-00 A.M.	7-3-55 9-00 A.M.	50.00 „	50.00 „
5-3-55 at 7-00 A.M.	5-3-55	9-00 A.M. to 9-30 A.M.	0 " 30 "	5-3-55 10-30 A.M.	3 „ 35 „	6-3-55 9-00 A.M.	7-3-55 9-00 A.M.	26.00 „	26.00 „
16-4-55 at 7-00 A.M.	16-4-55	9-00 A.M. to 10-15 A.M.	1 " 15 "	16-4-55 11-00 A.M.	4 „ 00 „	Escaped	18-3-55 9-00 A.M.	—	52.00 „
21-3-55 at 3-00 A.M.	21-3-55	9-00 A.M. to 4-40 P.M.	7 " 40 "	21-3-55 5-30 P.M.	14 „ 30 „	22-3-55 1-30 P.M.	25-3-55 1-00 A.M.	30.30 „	19.00 „
23-3-55 at 7-00 A.M.	23-3-55	9-00 A.M. to 5-30 P.M.	8 " 30 "	23-3-55 6-15 P.M.	11 „ 15 „	25-3-55 5-00 P.M.	25-3-55 5-00 A.M.	46.00 „	46.00 „
7-4-55 at 7-00 A.M.	7-4-55	9-00 A.M. to 11-30 A.M.	2 " 30 "	7-4-55 10-30 A.M.	4 „ 30 „	8-4-55 12-30 P.M.	9-4-55 5-00 A.M.	29.30 „	46.00 „
3-4-55 at 4-30 P.M.	4-4-55	5-30 A.M. to 9-30 A.M.	4 " 00 "	4-4-55 10-15 A.M.	30 „ 15 „	6-4-55 9-00 A.M.	8-4-55 9-00 A.M.	12.30 „	64.30 „
		Average :	00.30—09.30		3.35—53.45			29½—124	26—120
				Mean :	21.3				

Figure VII Showing Female moth

Figure VIII Showing Male moth

Figure IX Showing *Telenomous* spp. (An egg parasite of *Euproctis abjecta*, Swinh.)

Figure X Showing *Apanteles* spp. (A larval parasite of *Euproctis abjecta*, Swinh.)

Figure XI Showing *Brachymeric* sp. nv. (A pupal parasite of *Euproctis abjecta*, Swinh.)

Taxonomic and Nomenclatural notes on some plants from Pakistan

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1. **Volutarella divaricata** Benth. in Gen. Pl. ii 476.

The two genera *Volutarella* Cass. (Compositae) Dic. Sc. Nat. XLIV 36 (1826) and *Amberboa* Less. Syn. Comp. 8.(1832) are synonymous; the latter has been conserved against the former and is included in the list of Nom. Gen. cons. which was published along with the codes of International Botanical Nomenclature, Utrecht, 1956. Generic name *Amberboa* must, therefore, be adopted and the other rejected. The common species of *Volutarella* i.e. *V. divaricata* occurring in this country has to be called by a new name *Amberboa divaricata* **(Benth.) comb. nov.**

2. **Bowlesia asiatica** Nasir. Madrono Vol. XII No. 7 1957.

This species belongs to the section *Stellata* of the genus *Bowlesia* (Umbelliferae) and has been reported from Rawalpindi, Pakistan. All other species under this section are American ones, only a few have escaped to New Zealand. The queer distribution of this genus i.e. Pakistan on one hand and America on the other is of great Phytogeographical interest.

With great anxiety and enthusiasm I searched the type specimens of this remarkable species in Kew Herbarium, Surrey, so as to know in what important characters it differed from the rest while it was growing so widely apart from other species of the genus. Since the author has not given its diagnostic features it became necessary to study various morphological characters in detail. My interest soon cooled down when I found that most of the specimens of *Bowlesia incana* R. & P. Flora Peru xiii 28 : t 268 : 1802 syn. *B. tenera* Spreng. 1.880, 1825 lying in that Herbarium were hardly distinguishable from *B. asiatica* Nasir. This made me of the opinion that *B. asiatica* is nothing but *B. incana* which has escaped from its home-land and naturalized in Pakistan.

3. **Oligomeris glaucescens** Camb., Jacq. voy. Ind. IV 1838.

Of all the synonyms of the species known so far, *Resedella subulata* (Webb) is the oldest one and was published much earlier than this species. Since on transfering to the other genus, the oldest epithet has to be retained, *O. subulata* (Webb) Boiss. comes out to be the correct name for *O. glaucescens* and should be considered preferable to that name.

The dates of publication of Jacquemont's "Voyage"

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A description of Botanical collections of Victor Jacquemont was compiled by Cambessedes and Decaisne. It is usually understood that the date of publication of the 4th volume (parte Botanique) of Voyage dan's l'Ind by Victor Jacquemont was 1844 since it was so indicated on the title page. Sherborn and Woodwards (Ann. Mag. Nat. His. Ser. 7, vol. VIII: 334: 1901) have also affirmed this date by referring to Wiegm. Arch. 2:376:1845. There were, however, some indications that a part of this work was published in 1841 if not in 1839. This renders doubtful the dates of 125 new species and 12 new genera published in this work.

The following references have been chosen to elucidate the importance of the problem:

Endlichers Genera Plantarum

Vol. I, p. 839 (1839)	refers to	Oligomeris Camb., Jacq. Voy. Bot. P. 23, t. 25.
Vol. I, p. 966 (Feb. 1840)	,,	No. 5230, Jacq. Voy. t.30.
Vol. I, Suppl. II, p. 53 (after March, 1842)	,,	No. 3201, Hamiltonia in Jacq. Voy. Bot. t. 91.
Vol. II, Suppl. III, p. 79 (1843)	,,	No. 4015, Pedicularis Decaisne in Jacq. Voy. Bot. t. 122-123.
-do-	,,	No. 3763, Craniospermum (Lehm) Decaisne in Jacq. Voy. Bot.t. 130.

Walper's Repertorium (its date of publication was announced in Flora 700 Nov. 1842) and Botanische Zeitung 24, (Feb. 1843).

Vol. I, p. 46 (1842)	refers to	Caltha alba Jacq Voy. IV 6 t. 4.
Vol. I, p. 51 (1842)	,,	Aquilegia Kanawarensis Jacq. Voy. IV 7 t.5.
Vol. I, p. 201 (1842)	,,	Capparis sepiaria p. 21 t. 27.

Vol. I, p. 449 (1842)	,,	Geranium tuberaria Jacq. Voy. Vol. IV 33 t. 37.
Vol. I, p. 638 (1842)	,,	Trigonella Cashmirica Cambess. in Jacq. Voy. 36 t. 41.
Vol. I, p. 787	,,	Rhyncosia pseudocajan Camb. in Jacq. Voy. IV 45 t. 55.
Vol. II (Date announced in Bot. Zeit. 12 stk. 215 March 1844)		
Page 637 (1843)	,,	Allardia Dcne.

Reichenbach H. G. L. Der Deutsche Botaniker

Vol. I, p. 81 (1841)	refers to	No. 3084 Allardia Decaisne ad Jacq. Christolea Camb. ap. Jacq.
Page 183	,,	Douepia Camb. ap. Jacq.

Dietrich Synopsis Plantarum

section tertia p. 30 (1843)	refers to	Oligomeris Camb. 27 t. 25.

Decandolle Prodromus

Vol 8, p. 499 (March 1844.)	,,	Periploca aphylla Dcne. bot. Jacq. p. 109 t. 116.

Schrenk in Fischer and Meyer Opuscula iii 1842 writes about Waldheimia tridactylites Kar. & Kir. Diese aller liebste kleine Pflanze lasst sich von Allardia glabra Decaisne (in Jacq. Voy. Bot. t. 96) auf keine weise generisch trennen.

Page 180 of the 4th volume of the "Voyage" carries a footnote stating that the whole work of Botanical part started in 1834 and ended in Sept., 1844. This is in great contrast to the Index Kewensis which supplies dates ranging from 1837 to 1847.

Bibliographie de l'France No. 47 : 21 Nov. 1840 mentions that the Volume II of this work has finished and Vol. III is beginning and that the work will be published in 50 liveraison; but there is no indication whether parte Botanique was to be published after Volume III or independent of all others.

Comptes Rendus hebdomadaire Maydes Seance del Academie des Science p. 1041, 1843 announces the publication of liveraison 46 and 47, but says nothing about their nature.

There is no record of the publication of the liveraison even in the biggest libraries of the world such as Museum Naturalle History de Paris, Bibliotheque Nationale Paris, and the British Museum South Kensington. British Museum Bloomsbury Square has got a record of some proforma invoices of liveraison as they were received through Bot. of Bossange Barthes & Lowell. These are liveraison No. 25-26 June, 1840

... No. 38-41 August, 1842
... No. 42-43 November, 1842
... No. 44-47 June, 1843
... Nos. 48-49 September, 1843
... Nos. 50-58 June 5, 1844
... Nos. 52-54 February, 1845

But even these records are silent as to whether these liveraison were of the botanical or zoological part.

Two things are of significance in these references. Firstly, most of the authors cite only the table number from the "Voyage" which shows that the "atlas" was published separately from the description. Unfortunately the publication of atlas also has not been announced in any Journal. Secondly, some authors such as Reichenbach (1841) has cited references from the "Voyage" and they can hardly be expected to have kept intimate relations with Decaisne for this purpose. One might think of Endlicher, Decandolle or Walpers to have exchanged the proof copy, but why they attached so much importance to this work is simply puzzling.

Since in 1839 Endlicher was having a printed copy of part of this work, it is evident that the botanical part was printed independently of Vol. II which ended in 1840, or of Vol. III which started in that year. It is difficult to understand why it was not issued soon after it was printed. Summarizing all these references it is suggested that the following are the probable dates of publication of the various parts of Volume IV concerned with the botanical descriptions :

Page 1-88	1841
89-128	1843
128-183	end of 1844.

The sequence of exact dates still awaits support of more references and thorough investigation, but it is evident that the description of botanical collections was published not in one band but in various parts at different times.

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